

DRAGON



USER

January 1989

The independent Dragon magazine

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Editorial

OH, that is, every reader that comes. What do I say now? I thought about crawling under my desk and staying there, pretending that I never heard ruffing all that, but as Bob has provided a formal statement about Dragon User's future (or lack of it — see page 6), I can't get away with that.

"Are you going to the Weston Show?", I said to him on Thursday, wearily because work was piling up and I didn't see getting there.

"I don't really feel like it at the moment", he said unconvincingly, and then explained that subscriptions had dropped sharply, and he couldn't see how we could continue beyond the current issue.

I then have time to remove all the 'next issues' from the columns, but it looks as though Dragon User will die with this edition.

I am going to miss the old beast. I won't leave this week. But I don't like thinking of Dragon resources wasted. Something may be worked out so that our material will be available from another source. Support your remaining authors — Paul Gadsden, Simon Jones, Andrew Hill, Donald McRae. They are still *The Ones Who Do The Work*.

How to submit articles

The quality of the material we can publish in Dragon User each month will, to a very great extent, depend on the quality of the submissions that you can make with your Dragon. The Dragon computer was launched onto the market with a powerful version of Basic, but with very poor documentation.

Articles which are submitted to Dragon User for publication should not be more than 3000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should, where possible, be converted prior to print when paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article or program, so please keep a copy. If you want to have your program returned you must include a stamped addressed envelope.

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Letters

This is your chance to tell your visitors — tell us your joys, disappointments and complaints in Letters. Page: Dragon User, #88 Alexandra Road, Hounslow, Middlesex TW3 4EP.

Where is the OS9 group?

THE Dragon user discs and CD-systems, which I purchased in March 1988, contain a series of OS-9 user discs bought by the previous owner.

Having read these and found them informative and interesting, I have tried since to join the OS-9 User Group, by telephone and letter, without any success. May I, through your columns, enquire as to how one contacts the group, bearing in mind that I have written and telephoned on numerous occasions the group address? I am particularly interested in acquiring back issues discs from number 58 (July 89) onwards as there seemed to be a suggestion that an OS-9 tutorial was going to be produced and this, together with the programs and information contained on the discs, would seem to be excellent value for money as their subscription is only £10.

CAN you/does anyone up to date information about the OS-9 Users Group, someone, please? I have had two or three letters in recent months (which is less than three months) which I have not responded to, from people who can't get a response from the Group. Marion Morrison was hard to get hold of in person on at least of times, which is a right and privilege as a chairperson of an organisation, but I wonder if the address has changed without many of us realising it?

Postscript

WITH reference to Brian Clegg's answer to Adrian Chibnall on the Postscript language, I would also like to add that Postscript can be converted to parallel ports. At least, mine does!

I have an AGP Tandy 1400 with a Centronics port facility which can definitely be connected to the Dragon. The Postscript program, initiated by Brian Clegg in Dragon Answers is in fact

Every month we will be shalling out a game or two, courtesy of our supplier, to the readers who send the most interesting or entertaining letters. So send us your hints and your opinions, send us your hi-scores and suggestions. Send us your local Dragon stories. What do you think we are, mind-readers??



The Botto revealed

IN the November issue of Dragon User you'll witness the complimentary reference to the Dragon in an Atari magazine column. You will find the quote on page 63 of the July 1988 issue of *Atari User*. The article, entitled 'A thoroughly earned success', referring, alas, to the 512 rather than the Dragon - was written by Francis Botto (Frenzy8), and it was after him that the 'Botto' was named. A botter, of course, an inveterate and inadventent complainer paid by the supporter of one competitor to a competitor's product.

In an obvious attempt to

Francis Botto... who does that remind me of? Well, this is a timely reminder that, just because the Atari is larger

etc, the master/slave operator is preceded by the transformation matrix in square brackets, and not the ordinary brackets as given in the listing. Otherwise, the Postscript interpreter will not print the desired result. Furthermore, the 'e' or 'repeat' command will strip the string 'Dragon User' off the *Atari* page. The current listing of the Postscript programs is, in fact:

```
mathematic/flatten 1680 148
0 0
mathematic/xfont
1644 4000
(DragonUser) sfshow
showpage
```

If anyone in the Dragon world wants to know more about Postscript-based printers they can get in touch with me.

Steve Mandala

gram and ask it to COPY or REPLICATE a file across a with OPTIONS (NOC) and whatever I enter it looks up anybody's file but the one I selected and does their program, do the same, or does anybody know what is the cause of the problem?

809 Main Road
Old Coventry
Northampton
NN5 6NA

FO Some time ago the OS-9 Group seemed to have disappeared. However, they suddenly reappeared and I am a new member (relocated disc in March 1988) and there another in June 1988. This is the last I heard from the group. Do you know anything about them?

YES, I remember the first great disappearance. Perhaps Mandala intermittently just disappeared from the group and trying to remain alive and well at the same time is a bit too much for him. Peter Paul (Graffiti) claims that Mandala tried to maintain Mandala regular editions in Mandala for a while on this syndrome. I hope we hear something soon.

Coco converter

3 Kilburns Crescent
Weyford
Berkshire RG10 8AU

PS I am enclosing two printed outputs of my TurboBasicP. The first is the above program and the second is a fancy printing of the same thing.

Thank you, Steve. For the missing brackets, refer the reply about typesetting characters, somewhere on this page. I wonder if we have them intact this time...

Elite locked

HELP!

Can anybody help with Elite? When I use my pro-

grammed MacCoco I have bypassed the facilities very little software available for the Dragon will also run on the Coco, so I have decided to do something about it. I am willing to convert any Basic program and TRY to convert any machine code program, so that they will run on the Coco.

Now, as most people know, the ROM routines in the Dragon's ROM have different addresses to their equivalents in the Coco. With this in mind I would be eternally grateful if some kind Dragon guru could disassemble the Dragon's ROM and send me a listing, of course, I am willing to pay the postage and a reasonable fee for this service.

I have had a few recent successes in conversions, most notably Starsoft Software's Computer Companion, and

Destiny adventures. In addition I feel it only fair to point out that there are some machine code programs I have been unable to convert, for example, programs that add commands to BASIC, my windows, BASIC, etc. H.G. (Hansel) Westermeyer commands and Peter Whilker's (Griffith).

All I ask for this service is the odd acknowledgement, something to cover the cost of paper, postage, etc., and customers to realize that I can only do this in my spare time, so they will have to be patient and not expect a fully working and tested program a week after I have received it. Please enclose an assembly listing with all machine code programs. I regretfully I cannot convert disc software.

Paul Marlow
50 Lorne Ave
Brentwood
Pleasant
W. Midlands
B65 1JU

Paul Marlow
Summerside, Alderley
Warrington, Cheshire
WA1 3JL, UK 01925
24121

And further:

Since I wrote my letter to your letters page about errors in my Primesearch listing in November '88, it has come to my notice that there is a further (possibly) acknowledgement. Hopefully it is not too late to include the following to the list of corrections in my letter. I would be grateful if you would do this for me. Thank you.

Yours faithfully,
Paul Marlow.

(Editor looks into envelope. Nothing falls out. Editor checks letter again. Nothing but an envelope of white paper.)

MOTY letter
Dear Hester,
I forgot to write what the omission's were in my other letter today. Sorry I forgot it in my haste.

The omission's were:
080 183 = 0
My apologies again

Yours sincerely
David Weston (asot)

(Thank you for sorting out the odd man, David. As this is all written in beautiful Gothic script, it is a little difficult to be sure of the exact correction, as the Gothic apparently did not have a symbol for = and let us check the original ... and sure enough when clear close enough when read closely! silence ... and lo, it's already been wiped. I don't normally wipe things off I've checked them, but that doesn't mean that the typesetter's translation program won't lose something without me noticing, it does happen, see Harvey Green's letter elsewhere on this page. On the other hand, I can't see anything in "080 183 = 0" without machine associated ones and there are one or two points which bear distinguishing evidence of having been, etc. shall we say, repaired. Good nice nice nice things with no anomalies, Paul, and I won't have to reappear. David)

Primesearch search party

It would appear that several errors have crept into my Primesearch programs in the November issue of Dragon User.

Line 180 should read 180 AND =

The 330 in line 880 should read 320

Line 170 should read 270
PLRFLD NAME,PRGM
H7782,PCP 81,428

Lines 380 and 390 should each be incremented by 10 to insert an extra line which reads 380 GOTO 620 (I deleted this in error from the program thinking it was superfluous, but it was necessary after all).

I apologize for any brain-farts caused by the presence of these errors but hope you managed to sort them out yourself. In passing, may I stress that non-320 drive users should not feel damaged on seeing the DCC3 commands in the listings, as they may be easily modified, but at the expense of losing style to feel a much smaller range of numbers. Many thanks for the assistance with any aspect of Primesearch. Best send an E&H to me and I'll reply you as soon as I can.

the sporting services of Atlantic of Plymouth (see Dragon User September 1988). The new colour was good, the price reasonable. Of two orders received so far, one has come back as good as new, the other removed a little initially, but settled down after a few days. I would have no qualms about recommending them.

Malcolm Cowan
21020 Bristol Road
Luton
Bedfordshire
MK9 1HU
M19 3HU

No indeed, your letter comes timely after H.A. Duster's tale of disaster in his review. The success of this operation depends on some extent on the type of editor, and using a more intelligent one will eliminate the errors which are only made worse by re-reading. I wrote off a manual typewriter like that, once. Be assured, not now. By the way you don't know when the DS-9 User Groupie up to these days, do you?

and it helps some magazines (including this one) considerably that I choose to do so. I thought it for just that purpose, and unless there are 1000+ per one, it represents a great bargain. Again from experience, I can easily maintain a heating correspondence with friends up and down the country, which I would be less inclined to do if I didn't have a PCW.

A Commodore 64/128 is neat, though although that tends to be a games machine, I also do quite a lot of programming on it. It is now entering its seventh year, and is still a great computer for its price.

Another 10201 belongs to a friend of mine, and that gets use by me about once a week for shared development work on games. Again, for the price, it is a marvellous computer, it need certainly be MOT compliant project, and I wouldn't like to be in Paul Gapse's shoes were he to call my friend a selling meug within earshot. Felted by a single glance, most likely.

Then there is the Dragon, which I use for playing adventures. Although computer, it's not very have-a-go tools and so it isn't total cost to me, in real terms, is around a thousand pounds spread over two years of ownership in sunny Wigan. In other words, about the price of a packet of twenty cigarettes a day, or two-pence of butter at our northern prices.

So please don't turn Dragon User into a forum for one of those inane messages debates on which computer is best. The best computer is the one that you are making good use of at the time, and let that be the end of it.

PSWT would be a great help to me if you could get any pre-printed adventure, and I could incorporate everything into one big column, creating a little adventure fascicle within the columns of dragon user.

Hi-Gene
Sunny Wigan

NO, I haven't forgotten to include the disc, I shall be sending the next lot of errors in in plenty of time for your January news deadline. Hopefully, it will be the final copy date, because Peter's sending his stuff in on a disc which I can digest directly, and as it's two days before his birthday, and as I'm running late anyway, no rushdate for Ross.) but having just received and read bits of the October issue, the brain was cleared away from paragraphs and other passages just long enough to write this letter.

What prompted finger to keyboard was Paul Gapse's column. The phrase "Aha, Amstrad, Commodore etc. are all using mediocre products in selling mugs" was the one that did it. I regularly use computers manufactured by all three, none of which I would regard as being mediocre products. Nor do I think that I'm a willing mug for parting with my money.

I use an Amstrad PCW primarily for word processing,

which, I think Pete and friend would be exempted from taxation entirely on the grounds that they are putting their computers to constructive use. The mug is, after all, the one who is selling a pile of��undries cleaning, why aren't they at what I want? I agree about the PCW. If I had more room on my desk, I'd have one here and just use it for bashing out instant letters at the moment I think of them. No more, only short ones you write us. Helen?

I link this is alright

It's a bit late to be answering the query, but yes, I have used

News desk

Dragonfire still stoking

LASTEST price list updates from Dragonfire Services, new programs Market, tape I/O, Space Test 1.2.3, Draw Master, Time Machine Search, and The Investor's Share, tape and disk, £14 each. Dragonfire and Kids Pack, tape or disk £12. (Barlow Model, Diamond Manor, new version, £1 each. All prices plus 50% per item p&p £1.50, £1.25 per item overseas).

Now: Intelligent Copy. A simple but ingenious utility that backs up the entire disk (i.e. using a backup command, including the hidden boot routines, etc.) in the minimum number of disk swaps.

Designed for single drive users, but will save time on multi-drive copies too. Free copies of (Bootstrap auto-boot) and Utilities proposed screen display on the disk as well. £13.

Dragonfire will arrange a post office special delivery service over Christmas for an extra £1.75 on the price of a wholesale. Hopefully this column is unlikely to reach you before Christmas, but no doubt if it is a success Dragonfire will consider continuing the service.

Dragonfire Services, 13 Parry Jones Close, Birkdale, Swindon NP3 2NA.

Ethnologist finds new DOS bag

PHILIP Scott has written to us with a bug report on a fault in DragonDOS 1.0, SuperDOS and versions 1.0/2/plus to 4.0. "I have not seen a previous report of this fault, and Paul Gander has not heard of it," writes Philip. "How tragic!", says Bill Harris. Philip blames the bug for corrupting calculations and then directory tables.

It has been found recently that programs performing intensive disk output can corrupt normal calculations or cause SPCAO and SWITTE to access the wrong disk sectors. These errors can be both transient (for example, corrupting output from PRINT) and permanent and are difficult to

effectively detectable or detect.

It is perhaps worth noting that SPCAO and SWITTE usually writes back 20 (the directory track) when the problem occurs. It is possible to overcome the problem by adding program statements, but such programs generally need a different approach, and the effectiveness of the process can vary from use to use.

Dragonfire owners who have not been contacted should request exchange details for replacement by DOSplus 4.7.

Philip G. Scott, 4 Badgewood Drive, Princes Risborough, Bucks, HP10 8UF.
Can anybody shed any light on this?

Radiation maiden



THE young lady in the picture is wearing an overall designed to protect pregnant women from the possibility of miscarriage due to radiation from VDU's.

Although experts still disagree on whether VDU radiation from VDUs (or televisions) can disrupt the growth of embryo in the first months of pregnancy, research figures indicate that women working more than 20 hours a week at VDUs are more prone to miscarriage than those doing non-VDU work. A garment like this blocks up to 99% of radiation from most VDUs.

The Macintosh overall, shown here, costs £50 plus VAT and is available from computer dealers or from Mediabrade Marketing, PO Box 15, Bensworth, Hants RG10 7YH.

Visitext plus, plus

Visitext Plus by Dragon Software has been upgraded with better facilities for adding and deleting text, and block moves. Copies can also be laid out in more than one column per page, in magazine style, with the header and justification working within the columns. Dragon Software are expected to offer an upgrade service to existing users.

Dragon Software, The Bank, 18a Royal, Royal Derby, Derbyshire, DE1 1PT, 01245 82021.

From: Ken G. Smith

Repair man back

PC Spares has announced its Dragon User line, "Finally, after 12 months" has succeeded in moving house, and is now back in business selling spare parts for the Dragon, and undertaking repairs.

PC's classified ad. (page 27) mentions "transformers, RAM, MMU's and many other items, repairs and upgrades." For a price list, send an SAE to PC Spares at 26 Eaton Way, Great Potton, Bedford CM8 8EE.

Update to date

OCTOBER'S issue of Dragon Update features a page on Service Magic, a feature on Logo, two or three short programs, much correspondence arguing for/against the Dragon and the Amstrad ST, a review of the PCW Basic (written by Bob Preston) along business and the personal, several short games reviewed by Mike Scott, a user note on Commodore 64 from Philip Scott, and the usual couple of pages from Paul, among other things encouraging us all to support the show that NCDU's going ahead another two next year. This is Update's 50th issue, but wasn't quite the celebratory edition Paul had hoped to create so the old favourite, the potato strike - concealed Crosswords and so forth. And the editor would like some more articles. National Dragon Users Group, 10 Paul Grade, 8 Navan Road, Waltham, Essex.

No connection

SIMON Jones would like it known that his New Era Publications and Software company has no connection either with Harry Whitehouse's enterprise New Era Interface, nor with New Era, publishers of software fiction books.

Lee conquers USA

GORDON Lee has had a good response from readers of *Scientific American* to his Privileged puzzle, and we hope to publish an upgraded puzzle resulting from that correspondence in next month's issue.

MAKE THE MOST OF YOUR DRAGON

With our great value hardware and software:

SOFTWARE FOR DRAGON 64

For Dragon 64 (please state version)
 BASIC 2.0 Extended Basic £14.95
 Plus an extra screen with extended user compatibility (Dragon, Multicart, Dragon 64, and standard video card). Includes monitor card programming, monitorplay and 160k RAM. Types from 0-255.

Extra Utilities for 64 BBC 42

HELP UTILITY £13.95
 Dragon User Utilities, useful dragon utilities, including screen savers, improved BASIC, help and error messages.

SPREADSHEET £13.95
 User friendly spreadsheet, 1000 procedures.

WORKS UTILITY £13.95
 Plus lots of useful programs including currency converter, crossword, crossnumber, calendar, and more.

STRUCTURE UTILITY £13.95
 Structure BASIC for the Dragon, screen procedures, macro programs, macros and BASIC REPORT (20k/40k).

COS UTILITY £13.95
 Lots of 1000+ procedures, plus many other useful utilities.

PLM UTILITY £13.95
 Plus lots of useful programs including many useful utilities, lots more utilities and help messages. Includes utilities, including conversion, import using swap mode, memory management, and a command screen and dragon editor.

PERSONAL FINANCIAL - £13.95

NEW! Accessories for DRAGON

Monitor card for updating	£12.95
200k RAM card (with monitor card)	£12.95
200k RAM card (without monitor card)	£12.95
80k RAM card (with monitor card)	£12.95
80k RAM card (without monitor card)	£12.95
160k RAM card (with monitor card)	£12.95
160k RAM card (without monitor card)	£12.95
Monitor card for monitorplay	£12.95
Monitor card for monitorplay (with monitor card)	£12.95

COMING SOON SHORT DRAGON 64

HARDWARE

PLM 100k RAM card, no cartridge	£12.95
Monitor card (200-720)	£12.95
Basic Memory 80k	£12.95
Basic Memory 160k	£12.95
Basic Memory 200k	£12.95
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Basic Memory 29680k	£12.95
Basic Memory 29760k	£12.95
Basic Memory 29840k	£12.95
Basic Memory 29920k	£12.95
Basic Memory 30000k	£1

Second-saver for a fine tuned Dragon system

Program: Express/OS-9
Equipment needed: Dragon 64 with the DragonPlus board installed.
Supplier: Compusense Ltd., Millbrook Lane, London N17 8SF (0171 2651000) Price: £165.00

A fair number of Dragon 64 owners have upgraded using the Compusense DragonPlus board, the nearest thing to a Z80X Dragon which exists. I suspect this was mainly to get the very clean 80 column display, which is a great improvement using serious software. Another bonus is the extra 8MB of memory, which cannot, however, be accessed directly from BASIC. A recent issue of *DragonUser* has a program, and Compusense produced a special version of this which uses the 80-column display and can access the extra memory using a new POKE command. Apart from problems which appeared with the INKEY\$ command using this program, POKEing is hardly an ideal way to use an extra 8MB of memory.

A much better solution was to use the RAM as a scratch with either Plus or C64-It. The extra 8MB of memory is first transferred to a fixed disc, and then the user copies the most often used subroutines from memory to the scratch. Remember that Plus and C64-It use almost the full 8MB of the Dragon 64 for the programs they run, and any operating commands such as format, copy and DIR are normally picked up from the disc in drive 0 as required. This saves a lot of memory, since the normal Dragon 64 basic, together with DragonOS5 takes about 188K permanently away from the maximum 8MB which can be addressed by the 6809 chip. However, it does slow down the operations considerably, and uses the plus drives a lot more. When I first changed from my bunched-up basic recorder to this new C64-It since I managed all the above instantaneous loading of programs and files, I was I pleased the few seconds it takes to C64-It to read the few commands to load Mem (and

Memory, routines, Editor) is never noticed - that, I suppose, leads to Progress.

The ramdisk drivers available from Compusense and others enable the commands take-on-board almost instantaneously, providing you have first copied them into the ramdisk. A special startup file can enable this to be done automatically when booting up, but this prolongs the booting around on the system disc, during boot for about a further minute, which can be annoying if you only want to use one of the commands. Also, God's Law takes a hand - the command you want to use is the only one not copied to ramdisk!

More clever

The new Express/OS-9 is a much cleverer answer. It uses an advanced buffer buffering technique 'only used on large and expensive memory', is quote Compusense. The idea is to read automatically any command or program you use in a buffer which uses the extra DragonPlus memory, so if you use it again later it will load instantly. Thus, the first time you load the word processor StyleIt will take the normal loading time (a little less, actually, for reasons I will discuss) but if you return to Style later it loads from the buffer instead of half the time. This assumes you have not used so many other commands in between that you have exhausted the buffer memory of 16KB. Not only is there a time saving, but wear and tear on the discs is much reduced. Another clever feature is an option which enables you to store the disc directory track in the buffer. Since this is always accessed before any disc read or write, and often several times during the transfer of large files, much time and trawling of the disc heads can be avoided, which is why even on fast load the access is quicker.

Now, is it worth buying a utility to save a few seconds, and

are there any snags? Compusense claim that using the C compiler for a short program they took 160 seconds compared to the normal 272 seconds, and the compiler is too large for it all to fit in the cache at once, so this is not a 'best case'. If you are frequently using compilers this saving certainly seems worthwhile. The three main areas seem to benefit a little - your memory is permanently used by a module called XPR, that you have to initialise by both loading XPR and by calling a longer command called XP, and that the idea of holding the directory in memory can be dangerous to your discs' health. Imagine what would happen if you changed discs and then tried to do a write on the new one using the address of the old one? I don't know to David My Apeach will do something fairly horrid, no problem. If you change discs without clearing the memory first, the XPR (located) won't let you do that - it performs a Disc Change automatically before a new disc is read (it).

Compusense have addressed the last problem by offering a number of safeguards, using the command XPR, when changing discs clears the buffer (but what if you forget?). The command XP (XPR) will stop any writes according to the specified drive 00 so the worst that can happen is that you get some funny results after changing discs. This command is recommended for the drive which contains your system disc if you have at least two drives. However, you will probably want to save quite frequently on your data disc so this is not an option for the other drive.

Logic check

The command XP (C) tests Express/OS-9 to check logical sector zero of the disc each time. This tests C9-9 if the disc has been changed, and if this is detected the directory cache will be rewritten. However, this means the drive always starts

at 0 at each command, and none of the time saving is lost. Also, to guard against two discs having the same name, it is recommended that the supplied utility CLIP is used to timestamp each of your discs using the system clock. CLIP uses the last six bytes on disc for any which are otherwise unused by OS-9. This means each disc (over a backup) is unique. Sector zero checking is the default, which is switch off using the command XP -C.

The XP command has other alternatives. The parameter 1 initialises Express/OS-9 while X disc is on. -A disc activates drive 1, while A disc activates 0. \$ displays the status of each drive and displays the performance as far. This is an interesting one, as it tells you how many disk accesses have been made and what percentage has been saved by Express. The counters are then reset, but a similar command \$ does not reset them. There is a useful HELP command to display XP 3 or XP H. Both give a list of parameters and their uses.

The disc supplied contains utilities XPR, XP, CLIP and a sample STARTUP.FIL. XP must be copied into your command directory and you can do the same with XPR. Loading it before calling XP, it includes it in your boot file using C64GEN. The startup file does the usual things but also gets you into 80 columns, loads XPR and then calls XP with a number of parameters. These include Express without sector checking and enable write protect on drive 0, read/write 1 a read/write drive with sector zero checking and disable Express on drives 2 and 3. Finally the drive status is displayed. A 10 page All instruction header gives clear information apart from a few obvious mistakes.

Since Express is not compatible with user's ramdisks, there is a warning message on loading XPR if the ramdisk drivers are present in memory. This only applies for the Compusense ones - if you have the C64-It driver which has the self

verage of working with the same FORMAT command as above) no warning is given, Express also expects no free device\$ and so in theory does not give an error if they are not found. This doesn't seem to affect its use, however, apart from the status command 'A' which gives rubbish on the lines which would report on drives 2 and 3.

So much for the theory, what about Express in practice? My experiments related to the XPrologue giving a CRG error. This could, of course, have been a foolish blunder, though the GPO often caught in doing so, but packages, and I only mention it to highlight the fact that a phone call to Compuware resulted in a replacement by return of post. This worked perfectly, doing everything the instruction reader said it would, with one exception: the write protection does indeed give a 'write protect' error number 242 when you try to format a disk in a protected drive. However, when you try to use the COPY command this error that drives you gets an error 200 'syntax error in parameter'. Not a serious problem, but it could cause some head scratching! I then ran out in say what firm advantages were to be gained using my new Mitsubishi 80-track double-sided drives.

Timings using Mitsubishi 80-track drives

	80-track	120-track	80-track	120-track
Load Dynalab	12ms	12ms	6ms	6ms
Load Dynacode	12ms	12ms	6ms	6ms
Compile short C program (long)	4.5ms	6ms	4.5ms	6ms
Compile longer C program (long)	10ms	10ms	7ms	7ms
Compile short Pascal program (fast)	3ms	6ms	3ms	6ms

Load times for Stylograph and Dynacode are increased by 1 sec if -C option is not used.

Compuware say that their Dragon Data drives take 10 secs to load Stylograph, and that this was reduced to 12 secs for the first load and 8 seconds for subsequent loadings. Well, we won't argue over one second for the first loading. It is evident that the original Dragon drives were slower than mine, so that the potential benefits are greater. Even so, my loading times were halved and there was a very substantial time saving

while compiling both Pascal and C programs. If you usually make a coffee while waiting for the compilation, then this won't grab you as very important, but if (like me) you tend to write programs with errors in them and have to recompile several times to find them, then the time saving is useful.

A very noticeable effect was the reduced head movement of the drives while loading programs and increased a frequent loading of commands without the drive light coming on at all. This is much faster and must lead, as claimed, to less wear on the drives and discs. In this case, you have 80-track or double-sided drives, or both, then you can have all your commands and programs on one system disc. In this case use the -W and -C commands on drive 0, and don't remove them. It is probably safer not to use the -C option on drive 1 as you will be reading and writing data to you cannot use the W to reformat your drive. If you are using multiple user disc systems, and work files, for instance, on each, each one will be used but waiting until later files and other programmes over a period of time. (I still had 40-track single drives I don't think I would use the -C option at all, since the dangers of forgetting to do an XPP when changing discs far

outweighed the benefits, a few being like a stored in memory, where you have poor final file, then the extra time and memory taken in loading Express is probably not worthwhile. In any case, Compuware are to be congratulated on an imaginative and welcome addition to the GPO armoury, and so deserves five dragons for what must be the most useful software addition for some time. It also makes the DragonPlus board an even more attractive add-on for the Dragon.

David Howley



New games new faces

Title: Mandragore

Supplier: Koga Software, 94 The Oval, Firth Park, Sheffield
Price: £4.80

MANDRAGORE is a new arcade type game from a new software house, which just about symbolises the metamorphosis of the Dragon market recently. Gone are the old stalwarts like Microdata and Quickbeam to be replaced by new producers such as

such as Koga of the Boar, a firm being like a stored in memory, where you have poor final file, then the extra time and memory taken in loading Express is probably not worthwhile. In any case, Compuware are to be congratulated on an imaginative and welcome addition to the GPO armoury, and so deserves five dragons for what must be the most useful software addition for some time. It also makes the DragonPlus board an even more attractive add-on for the Dragon.

As for the game's objective, that seems to be to avoid hazards or to shoot them and not only that but to get to the end of level 2 with one your precious lives intact. I don't know what happens then, as it's a difficult game. The first floor is relatively easy; you move up and down the pyramid like shooting mutant sand-worms portrayed in ancient graphics and which transform into equally impressive snakes once shot. Although once dead they can no longer spit venom at you, to health there is still deadly, unfortunately. Other objects on the first floor include a fairly tame scorpion which fires the odd bullet and small pyramids on the floor which block your way.

In fact there is no aspect of the graphics I can criticise. Once the first floor is completed other well drawn objects and creatures appear, such as screeching eagles and ants which run relentlessly at you. All this is portrayed in heretofore black, which I always think is less visually effective than the Dragon's only other real option, black/white, but is perhaps less successful on the eyes.

Joystickers in action again here, with traditional Dragon stick being more efficient than my Atari Joystick, as small tape on the stick are needed for up-down movement rather than big lumps.

With Mandragore and Lucifer Kingdom being the last two new Dragon programs I've looked at I can safely say that quality software isn't dying up. Mandragore is one of the best graphics games I have seen for the Dragon; its quite hard to lose a life to see yourself fall into a pile of spikes while your cap spins round in the air before falling to earth. The only problem is that I don't find it the most addictive game I've ever played - not quite as addictive as say Clueless Kingdom, but any program as well written can only deserve the accolade of the Dragon.



of a 120-track drive.

It is worth the £17 price tag? It, like me, you get your GPO staff at the best price from John Penn then programme as much for a C compiler seems expensive, but if you consider the original Dragon Data prices for GPO-8, it seems cheap. And remember that Dragon Data prices are much cheaper than comparable software for other computers... If you do a lot of compiling, then the system commands a lot, then it has got to be worth buy-

ing, if you normally load up straight into Stylograph or Dynacode, and play games on them you have poor final file, then the extra time and memory taken in loading Express is probably not worthwhile. In any case, Compuware are to be congratulated on an imaginative and welcome addition to the GPO armoury, and so deserves five dragons for what must be the most useful software addition for some time. It also makes the DragonPlus board an even more attractive add-on for the Dragon.

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Philip Green

January 1989/Dragon User 7

Wordsearch

Please get your answers to the Dragon User Wordsearch Department by the end of the month on the front cover.

WELCOME to the first Dragon Wordsearch! Now that the Third-Crossword is soon to retire, it has found a worthy successor! All you have to do is find the word currencies - listed on the left - hidden in the Wordsearch grid. The letters remaining when all have been located will spell out, when rearranged, the name of Oregon software title *Code EHO Of ENCLAGEMENT* (8.2.3.4).

And what of the Twelfth Dragon Crossword, still waiting to be solved? It's reports back to us, governing under the weight of its followers.

"We have here Richard Cross of Wigan, who would like anything in 3000 invested almost anything and, and a Corby of Alf Witting, who fondles a record of Macgammom.

The phrase is DISC INTERFACE.

Send your answers to the First Dragon Wordsearch to Dragon User. The first correct answers out of the Editor's will win something from the Magic Bottomless Box. By telling us what you'd like - you might be lucky.

T H E C N A R F D I N A R
H O K O S U P C T D M T R
T R E P N E E R N R E N
R O S E R N T A S D H E E
O R E K T M C I N O R E Y
F T O R I H H A M R I F R
U P V I M L R C U E D D O S
K O I R N R L I S O F L E
C R F R E N L I L T O E S
E T O O D S O E L N T U K C
P L U N B T R F Y G N E U
O R I E A R R K P I D H D
K R A M L H N E F N E G O

Find the word currencies hidden in the grid.

FRANC
BRAZ
KOREA
KRONA
KRUGERRAND
LEU
PARK
RIL
PESETA
PESO
PFENNIG
PIASTRE
POUND
RUPIE
SHEKEL
SILLING
YEN
ZLOTY

BOLIVAR	DEUTSCHMARK	DRACHMA
CENT	DMARK	ESCUDE
CENTAVO	DIRHAM	FENI
CENTINE	DOLLAR	FORINT

Screening the Dragon

Radio amateur N J Cleaver lowers the noise threshold

The following information may be of some use to users of the Dragon, particularly radio amateurs, of which I am one.

I use the Dragon with a single disc drive and monitor together with a Texas T171HF transceiver to transmit and receive radio telegraph (RTTY) software supplied by Dragonsoft Software.

As a lot of readers will probably know, the Dragon does tend to generate a rather a lot of radio interference which can cause havoc when trying to receive radio RTTY. In my case this was no exception.

I have tried various methods to eliminate this interference, for example, thorough screening leads to every piece of equipment, and the physical repositioning of components and case. This had some marginal success but was still plagued by the interference directly radiated from the Dragon.

Having read articles about screening the case of the computer, I decided that I would set about spraying the inside of the computer case with a conductive naked screening spray.

The Dragon case comes

apart very easily by the removal of the four screws located underneath the case. Next the printed circuit boards are released by the removal of the screws at each corner of the boards. There are two ribbon cables, one connecting the keyboard to the main circuit board and one connecting the power supply/video modulator board to the main circuit board. Once the screws are removed all three boards can be lifted out of the case.

Next the inside of the upper and lower parts of the case must be thoroughly cleaned. I used washing up liquid and a soft cloth to remove any residue, and the physical repositioning of components and case. This had some marginal success but was still plagued by the interference directly radiated from the Dragon.

Inside of the case after the spraying has been completed.

The actual spraying part is the easiest and only took approximately minutes. To prevent overspray I used a large piece of flat card held against the edges of the case. The Dragonboard (but not the wires) must be sprayed over too. The metal spray dries in about ten to fifteen minutes.

When reassembling the Dragon you must ensure that only the (bare metal) parts of the circuit board come into contact with the case. Specifically one part of the Dragon keyboard which actually touches the case, that being the left-hand side support. This support can easily be sprayed clean of naked spray to prevent any short circuits.

To earth the inside of the case I connected the wire that was soldered to the circuit board to an earth point on the power supply. This effectively earthing the inside of the case. I cannot stress how important it is to check that there is no part of the wiring or the circuit board touching the case. Having connected the wire the case can be reassembled. The upper half fits snugly into the lower

half, making a near perfect earth shield around the circuitry. The shielding cannot be made 100% perfect, as there are outlets for playback/printout cassette ports etc.

When reassembled to my transmitter, the results were very pleasing. A very large reduction in computer-generated noise was immediately noticeable. How many more weak stations can be received than before. The problem of TV-generated noise from the television generator still exists, but it is only a minor irritation compared to the noisy Dragon.

I must state that the Dragon User cannot be held responsible for any accidents or disasters that may befall anyone attempting this modification. The naked spraying spray can be obtained from Dragon Electronics, part no. YM817, page 466 in the current catalogue.

I would like to add in closing that I very much appreciate Dragon User, having every single one since publication started, and I usually find something in every issue that is of interest.

Introduction to Dynacalc

J B Slinger introduces the spreadsheet package Dynacalc.

THEIR was a request in the July issue of *Dragon User* for someone to write about Dynacalc. Dynacalc is a spreadsheet package. A spreadsheet is a big table with lots of 'cells', called cells, arranged in rows and columns. A spreadsheet package is a computerised version which has been partially pre-programmed. In use, a user completes the programming to suit the particular need of the moment. Putting it another way, a spreadsheet package is an ultra-high-level language for programming tabular calculations. I could have said that at the outset but didn't for the reason that spreadsheet packages are always described as potential purchases in such a way as to minimise the programming aspect. Quite senior managers write or build computer spreadsheets, which they would not do if they thought of the activity as programming! (No, it's true, all that business executives wouldn't use computers because they thought it was typing.) But in truth, the language is so high level that the programming is minimal as will be seen.

Locked in cells

The programming consists of typing formulas into the various cells. The terms may be text, or figures, or expressions (formulas). The first two are self-explanatory; expressions are given in terms of cell references rather than variables but, this aside, will be understood by any Basic programmer. Thus a cell which contains $100^2/64$ will contain the product of the contents of the two cells known as B1 and B4. Note that if the contents of either of these cells is changed, the computer spreadsheet will instantly recalculate to show the new result. Inside there are a great number of preprogrammed functions; for instance $(\pi 20^2)/4$ will evaluate the square-root of the expression in the brackets. Traditionally, cell references are given with the convention that a capital letter is used to denote the column and a figure is used to denote the row; cell B1 would be the second cell from the left, and 3 rows down.

At this point is is worthwhile to introduce the word worksheet to describe a computer spreadsheet; this is common jargon and denotes any possibility of confusion between a paper spreadsheet and a computer one.

As an example of a worksheet, look at listing 1. The meaning of each cell will be obvious although the overall objective may be obscure. So before describing the programming, I shall digress to explain the objective, which is to solve *Dragon User's* September puzzle.

Briefly the September puzzle was to find a vulgar fraction which is a close approxi-

mation to the fourth power of pi, the circular constant. From this vulgar fraction one had to produce an approximate value for pi which I will call Indian pi. In deference to the man who discovered this approximation, Indian had to be accurate enough to give an error of less than 1 inch in the circumference of the earth when compared with the value calculated from the accepted value of pi. I chose to set up my worksheet to follow this statement of the problem. For further exemplification of the worksheet method (and Basic programs of the same method, see listing three. The degree of precision of the Dragon Basic is barely adequate for the problem but the method should be clear enough. I calculate the diameter of the earth in inches, and thence the circumference of the earth, in lines 30 and 40. I also calculate the 4th power of pi. This has to be converted to a vulgar fraction by trial and error. I multiplied the value of the 10th power of pi by various trial integers (trial denominators) and rounded off the product to trial integer denominators (see lines 70 and 80). Each numerical/circumference pair was then converted to a trial value of Indian pi and the final circumference was calculated and compared with the true value. I used the same method in the worksheet except that the trial denominators were put into cell B1 individually. Because Dynacalc is accurate to 16 significant digits, the procedure gives an acceptable value for Indian pi and the vulgar fraction.

Now to return to the mechanism for programming the worksheet. I use Pico, so I have to boot the operating system first and then load Dynacalc. Actually I do both at the same time since my Dynacalc disk has the operating system on it as well and I wrote a startup file to load the package automatically. When loaded, Dynacalc displays an empty worksheet with the default column-width of 16 characters. This is OK for most purposes, but I had decided that 20 characters width would be more appropriate for my present purpose so I had to change it. This was done by typing *W20W16*. This made two *W*'s; the first *W* signifies that I want to type a command. The *A* means that I want to change 'attribute' of the worksheet, the first *W* signifies that I want to alter a window (Dynacalc has nine), and the second *W* that I want to alter the width. There is a question then asking me how many characters wide and the figure 20 is the answer. Entering information into the worksheet is simply by pointing to a cell with the cursor keys, typing the entry and pressing Enter. If the contents of the entry cell are used in an expression in another cell, the worksheet will instantly recalculate itself to reflect the change. Magic!

Well not quite magic because there are three subtleties. The first one is that certain formulas only need to be evaluated once,

for example in *Settings*, see and two, the diameter, the true circumference, and the 4th power of pi are really calculated constants. I chose to leave these as formulas for the purposes of this article, but in a real situation, in memory and for speed of recalculations, I would want to evaluate them once and for all time. This can be done by entering the expression for the circumference in the form $=20^2*3.1415926535897$.

Exclaim and vanish

The exclamation mark causes the formula to be evaluated (and to disappear) and then pressing the Enter key stores the result in the cell. The second subtlety is that recalculations of a worksheet follow a definite order; it is by columns or by row (selected by *RCR*) or column-wise or (PCR) for row-wise recalculations. Whichever is selected, the calculation recalculates from the top left (see *A1*). At any cell that has a reference to a cell which has not yet been recalculated the cell will not evaluate correctly. There are situations where forward references have to be used, such as where one is doing an iterative calculation, but one should try to avoid forward references if at all possible. If there are forward references, one can cause recalculations by pressing the exclamation key several times until the values stabilise. The third subtlety is my own. Listing one is the natural/default format in that it shows the figures not the formulae. However, I prefer to build a worksheet in the format of listing three. You can switch between the two formats with a toggle command, *W3D*. There is supposed to be a way to have some cells in formula mode and some in value mode but I have not found it; also there is supposed to be a way to protect certain cells to prevent inadvertent corruption of a worksheet and I have not found that either. Both of these features are desirable as it is as easy to corrupt a worksheet as it is to build it. Pay attention to this if you build a worksheet for someone else to use.

Good presentation

I should now like to review the advantages of using a spreadsheet. I have already mentioned the 16-digit precision. It is quick to set up a worksheet; the spreadsheet probably took less time than reading this article will take you. It is easy to get a good presentation of a calculation, think how nice it would look if the data, the method, and the results all in one table for a research report. Irrespective of the calculation feature I know of no other way to do a worksheet simply as it is the quickest way to type a table (trivial but true).

LISTING 5

1. Arithmetic type Functions

<code>ABS()</code>	Absolute Value, as in Basic
<code>COS()</code>	Cosine, as in Basic
<code>SIN()</code>	Sine, as in Basic
<code>TAN()</code>	Tangent, as in Basic
<code>AVERAGE(list)</code>	The mean value of numeric cells in the list
<code>COUNT(list)</code>	Number of numeric items in list
<code>EXP()</code>	Natural logarithm, as in Basic
<code>INT()</code>	Integer value, as in Basic
<code>LOG()</code>	Log. to base 10
<code>MAX(list)</code>	Returns the largest or smallest value from the list
<code>NPV(list)</code>	Net Present Value of items in list
<code>PI</code>	Used in financial work
<code>RND()</code>	Random number generator
<code>ROUND(d,n)</code>	rounds off figure n to a degree specified by d which is a power of 10. Note alters the number as opposed to its appearance
<code>RIGHT()</code>	Square root, as in Basic
<code>STDEV(list)</code>	standard deviation of numeric items in list
<code>SUM(list)</code>	Sum of numeric items in list

2. Lookup type functions

<code>CHOOSE(n,list)</code>	Chooses nth item from list. "n" is usually the contents of a cell
<code>INDEX(n,list,z)</code>	Lookup function based on exact matches between n and an item in the list; returns item offset from the matched item into column or row z
<code>LOOKUP(n,list,z)</code>	Very similar to <code>INDEX</code> but based on greater than test

3. Logic type Functions

<code>AND(list)</code>	Returns true if all are true
<code>ERROR()</code>	Returns true if 1 is true
<code>ERROR</code>	Forces logical "error".
<code>IF(test,true,falsel</code>	Returns contents of true cell or of false cell depending upon whether test cell is true
<code>ISERROR(cell)</code>	Test if cell has logical "error"
<code>ISNA(cell)</code>	Test if cell is empty
<code>NA</code>	Forces logical "not available"
<code>OR(list)</code>	True if 1 or more are true
<code>NOT</code>	Returns logical "false"
<code>NOT(item)</code>	Reverses truth value
<code>TRUE</code>	Returns logical "true"

Basic Monitor

Craig Henderson gets inside his Dragon's memory and operates

THIS Monitor program was written to aid me in examining the contents of my computer's memory and performing various tasks on it. I am very new to Machine Code and I own Address from Gwyddon Software. Although this has a monitor I found it was very tedious to load the whole thing in each time I wanted to use only the monitor so I decided to write my own.

I realise that Peter Whitaker published a monitor written in machine code in May 1982 but I had one written in Basic since convenience not only to type in but to leave more memory space for the machine code which is the subject of your interrogations and it is easier to LOAD off cassette.

When you run it you will get a title page and then will be asked if you want to load some Machine Code off cassette. After that you will be asked the width of your printer and then go into the main program. If you have not got a printer then just enter 0 to the width.

Operations

The program has eight

operations which are called from the main menu by pressing the appropriate key [the ones shown in brackets here]. These operations are: (0) Dump the active memory with auto-scroll, (1) Copy a block of memory, (2) Display page (block) of memory, (3) Edit memory, (4) Modify block of memory, (5) Output hex dump, (6) Poke memory location, (7) Verify block of memory, (8) Examine memory with auto-scroll. You will be asked to enter the start address as well as all the routines, and then a screen will fill up line by line. The speed of this can be altered by pressing keys 0-9; 0 is a pause, 1 is fastest and all others in between respectively. When you enter this mode, there will be 16 digit hex-decimal values on the left next to the address and on the right are the corresponding ASCII characters. These characters can be made to disappear and re-appear by the pressing of (W). To quit the routine and return to the main menu press (Q).

(C) Copy of a block of memory. On calling this routine you will be prompted for the start

and end addresses of the block to be copied, followed by the start address to be copied to. A line of 1000 bytes at a time is on the screen which I find plenty. If you selected this routine accidentally, enter the start and end addresses at the same value and you will return back to the menu. (D) Display block of memory with only the address of the byte in the top left hand corner of the screen displayed. The address of this block can be changed by pressing the UP and DOWN arrow keys. (E) Edit program. This re-boots the machine so be sure not to use it until you have a safe copy on tape or disc. (M) Modify block. You are first asked for the start and end addresses and then if the same subroutine is being altered, another editor block. If (Y) then you enter the value and the computer will do the rest, but if (N) you are asked to enter them all individually one after another and the address is shown. (O) Output dump in hex-decimal with auto-scroll to screen or printer. The start and end addresses are prompted for and then if the data is to go

to the screen (0) or the printer (1). Then the data is either dumped straight onto the printer or to the screen with auto-scroll and at the end a small pause before returning to the menu. This can be passed anyway by using the usual <Shift> and <g>. An example of this dump is shown in listing 2. (P) Poke a single location with a value. You will be asked for the address and then the value and then you will return to the menu. (R) Verify a block of memory. Following the input of the start and end addresses, the computer will display the current location and value of which it is looking. If the location is OK then it will go on to the next location, but if there is something wrong for that area it (R) will then you will get a failed message with details.

I do hope this is of use and you enjoy using it. If you do not like the idea of typing this in then a copy is available from me on cassette at the price of £2. Send a cheque to Craig Henderson, 'Sandie', 28 Melbury Avenue, Wells, Somerset, BA5 2SW.

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999999 : 765948769167C98C57E9B857EBCAD7E9D147E6D927E8DCF7E8D9C= 81622
9991D : 7E9E8E87E8E127E8D677FBAD7E8D457E8E7D7E8E7D7E8E7D464F0= 81630
99936 : 41707B245C047454C53C549C6444154C138024948044FC1A49E2935= 81639
999999 : 67D4887E7C447E8D9C= 81639

1686C : CB924854550CE53548FD4714F49C5434F4EFD44C4953D4434C454) = 891F
 16867 : 1D24D45D77445562454C4F1D44353415A154F5045CE434C4953D4434D = 8804
 16868C : 1D04953D45345D452405340D4434C4D447544F02534F554EC44155 = 891D
 16869D : 14449CF455845C553484950064445004544490454524FCE54024F46 = 8A7
 16869F : 1D540C79EC559434C035853450458524553458453435345453C53843 = 8987
 1686A3 : 14D4541D02434F4D4F024349504340C508411694E0D44745D45855144 = 8A8C
 1686B6 : 153413073834F58D9584D4F4C75844C41D9444C4F41D83245465503 = 8988
 1686C9 : 1D94142462540F5350224443544945CE4E4F4D535445384745C4486D = 8C4F
 1686D4 : 1A44A7D4144E044F029E98DC55534798C78442202795168516861686 = 8D4C
 1686E7 : 1478513793D961758728853288027916300777868C87W8851485F388537 = 8C1B
 1686F4 : 168793D853808348571814579C18634864288288440024497D9794894 = 8DCC
 1686F5 : 157F48918A7940D780778881589D6199457A7779D7749A8C9468F47 = 818D
 1686F8 : 1A99F0A11A9D88C888C77A9F8A0F388511A88A9A8D80484490F853 = 811C8
 1686F9 : 147C844846044142D3584F4D8246405351D2464F0745288253492C47 = 8C9C
 1686FA : 14F4D3544102415437584545CB4C450E538432945641D04153C54349 = 8DCE
 1686FB : 152044349F38449F55354C864790848455444D4454244452494748 = 899D
 1686FC : 1544444D479444447884F4946D44748414579144D45C056415772548249 = 89AB

Letters

This is your chance to air your views — send your tips, compliments and complaints to Letters, 49 Alexandra Road, Hemel Hempstead, Hertfordshire HP3 4BP

Continued from page 3

PLEASE find enclosed a copy of the screen dump required for the Brother MFC, which was incorrectly printed in the July '88 issue. Hopefully this one will get through without the mistakes. If anybody wants it placed on disc or cassette then I'll gladly do this, provided they send us a SAE and disc or cassette.

Thanks for everything and it is only little errors that stop us from being up the great work.

Harvey Gray
Steve Bell
Green Room Unit
Bitternway
Green CM11 2AY

Right, well we have the listing ... it's a bit fat and foisted, so I'll just copy over and you A, instead of putting it through the hyphenator. For instance ... Right, we now have a listing that corresponds to Harvey's one. And here it is:

```
10 DIM A(1,11)
20 FOR K=0 TO 8:ENDK:AIK,01,AIK,11) :NEXT
30 DATA 1,3,1,1,6,3,1,3,3,6,6,1,3,3,1,3
41 :1
45 PAGED1:SCREEN1,0
50 PRINT#1,CHR$(27) ;"A":CHR$(1)
55 FOR L=0 TO 255 STEP 4
60 PRINT#1,CHR$(131):CHR$(27):CHR$(1)
65 :CHR$(111):
70 FOR K=191 TO 8:STEP -1
75 :TD#1:SA#0:FD#0:TD#0:PRINT#1,L,M,0
80 :T#1#4:AP,01:CS#2#4:AP,11) :NEXT
85 PRINT#1,CHR$(11):CHR$(11):
90 :NEXT K,L
```

Martin AMJ's last word

Regarding Roger Mervin's article in the November issue about the CoCo in Britain, I can say that in our Multi Computer Club we have the CoCo3.

Now with four computers in the house, Dragon 32, appended to it, a Dragon 64, a CoCo-2 64 and a CoCo 3 (2MHz), needs upgrading to 1.6MHz but due to high costs of the required chips, still 1.0MHz. Under C68 I try to switch my three drives a Maxtor 1.25 (4048), two 3.5" 1.44MB by Centech from Dragon 32-C68 based to the Eurocard and Penta's baby, to the CoCo 3 C684 level 2/1.0f by Tandy. And it works, but there are problems.

For instance, the formats and sizes of the tape-pseudodiskettes is not a plus for the Dragon, but due to the older machines, the CoCo 3 has still to ride on the old 3.5" track ... I have tried Kystal Style and RIMM under Level 2 on this

CoCo 3, but no luck so far, maybe you guys know the answer to that, Jason (should, where are you?)

It is a pity, to conclude, that the manufacture of the Dragon has stopped. If we had the kind of video-chip from a CoCo distributed in the Dragon, a sort of master memory manager, then it would be a Super Colour Computer, because the old board has still nowadays features which the CoCo 3 lacks.

PF and I am still waiting for this kind of machine, a Dragon 320, which was promised to me by Eurocard's Technical Manager, to have a review of it. So until this one, Eurocard, you're keeping to a gone spirit ...

Martin AMJ (via Mervin,
3 Glynneath,
Cleator,
Cumbria)

Funny you should say that Martin ...

Quick on the Draw

Steve Taylor draws the line — from assembly fast

TM32 is designed to replace the `lasm` LISP command for use in assembly language in PMODE64. I was prompted into writing it by Brian Cadge's reluctance to explain how to use the `nm` command from assembly. Although it can be done, it's as complicated and messy that I agree with him entirely — it's not worth the effort.

The non-rasterising option in any PMODE, and in any valid colour list, has this program as configured for PMODE 1, only although it does work for colours 0, 1 or 2 colour 1 on 0 using either SSCREEN 1.0 or 1.1. The reason for this restriction is that anyone attempting to write graphics programs in assembly language can easily reduce speed. Generalising the program for multi-colour and several modes would slow it down too much for it to be of any advantage.

Use has been made of Bresenham's algorithm 5, which is extremely fast. The reason for this is that the normal incremental algorithm requires dy/dx to be calculated, the result of which must be stored as a binary fraction to preserve accuracy. Division and fraction handling are both extremely time consuming and so Bresenham's algorithm uses only integer addition, subtraction and multiplication by two (which is achieved quickly by a logical shift left).

To use the routine, first describe start and end points in the array LDATA, in the following format:

пока - 3
пока - 2 - 1
пока - 4 - 3
пока - 5 - 3

where the Microsoft notation is LINE(0,0,100,100,70). If the line is to be PRESET, then set the value of the background colour in the variable BKGCOL (black = 0, green or white = 1) after SCREEN 10 and LSET. Setting the value of the background colour in BKGCOL will cause the line to be PRESET. Then call the routine with BGP-
STLINE. All registers used are preserved.

Note that all the coordinates are 16 bit values in order that negative numbers are handled correctly — a 16 bit register should therefore be used to effect the divide.

Please also that $\delta\chi$ must be greater than $\delta\chi$ with a line is drawn from left to right. This speeds up the routine. Failure to observe this condition could produce strange results.

Vertical coordinates are automatically fast. You can do much of the fast that until the position of a pixel has been determined, it does not change horizontally and so all that is necessary is to move the set point by 32 bytes each time. To clean a vertical line, first store the upper Y coordinate in location YU, then store the lower Y coordinate in YL, then YU. The X coordinate is stored in XCOORD. The routine is then called with RSRVA, and RSL. Again, all registers are preserved and the stack is unchanged. Note that the vertical line is always drawn from bottom to top and so YU should always contain the Y coordinate which has the smaller value.

Both routines take the top-left of the screen as *pdcp*. Although this is an unabbreviated staged notation, presumably conceived by some particularly zealous at Microsoft, it has been retained for the sake of familiarity. It also makes calculations that little bit easier.

Subsections

The subroutine **WBYTE** returns the address of the byte containing the graphics coordinate stored as (XCORDYCORD) in location **DATA** using the parameter:

BTTE = 550000 + 0.000001 + 0.00000001

where **SDRAT** is the base address of the screen. This is stored by BASIC in location **BA** (hex 40) so the routine produces the correct multi-line/graphics stamping using **PRINTER 4.1** - **PRINTER 4.2** and irrespective of whether or not chars are connected.

The subroutine `WPI001` determines which position within `WPI01` is being referenced and returns the mask and/or register (ie if you imagine the 8 registers mapped onto `WPI01`, then there will be a 1 at the position

of the pixel and a 0 everywhere else.

One further point ... neither BT1,BW1 nor VLINE check if the line being drawn is actually on the screen. It would therefore be quite possible to draw a line from (0,0) to (85536,85536) although if you try it you will almost certainly crash your Delphi - based application.

Finally, if anyone has any problems or wants anything explaining further, write to me at 88 Plain St. Rd., Shirley, N.Y. 11967 enclosing a stamped self-addressed envelope.

References

1. Algorithm for Computer Control of Digital Photo, J.E. Bresenham, *IBM Systems Journal*, v11, 1972, pp25-30.

```

LDY #LDBDATA+2
LDY #LDBDATA+6
LDS ,X
CPD ,Y
BNE SWAPY
LDS ,Y
SUBD ,X
STD DT
BRA (CONT)
SUBD ,Y
STD DT
LDA BEE
STA FLAB1
LDS DT
CPD DX
BNE YINC
LDS #YCDBRD+1
LDY #YCDBRD+1
LDA LDATA+B
STA FINISH

```

SUBB	LEATA		LDA	FLAG1
STD	DX		CHPA	BB1
BED	LEAVE1		LDA	YORD2
LDA	S-1		LEAU	A,U
STA	YORD2		STU	-1,Y
LEAVE1	BRA	INIT	LBSR	BYTE
YINC	LDK	BYCORD+1	LBSR	WPIXEL
LDY	ENDCORD+1		LDU	BYTE
LDA	LEATA+7		LDA	ENDCOL
STA	FINISH		CHPA	BB2
LDD	BY		DEG	BLACK2
LDU	DX		COM	,U
STU	BY		DRB	,U
STD	DX		COMB	
LDA	FLAG1		BRA	WHITES
CHPA	BB1		BLACKS	DRB ,U
DEG	INIT		WHITES	STB ,U
LDA	S-1		LDA	,X
STA	YORD1		CHPA	FINISH
INIT	LDD	BY	DEG	LINES
	LESLB		BRA	LOOP1A
	ROLA		LINEND	PULS X,Y,B,U,PC
	STD	INCR1		
	SUBB	DX	-----	
	STD	DEE	-----	
	LDD	BY	-----	
	SUBB	DX	-----	
	LSLB		-----	
	ROLA		-----	
	STD	INCR2		
	LDA	LEATA+1		
	STA	YCORD+1		
	LDA	LEATA+3		
	STA	YCORD+3		
	LBSR	BYTE		
	LBSR	WPIXEL		
	LDU	BYTE -		
	LDA	ENDCOL		
	CHPA	BB2		
	DEG	BLACK2		
	COM	,U		
	DRB	,U		
	COMB			
	BRA	WHITES		
BLACK2	DRB	,U	LDB	BYTE
WHITES	STB	,U	STB	BY
LOOP1A	LDU	-1,X	LDY	DX
	LDA	YORD1	LDB	YCORD
	LEAU	A,U	LEA	ENDCOL
	STU	-1,X	CHPA	BB2
	LDD	DEE	DEG	BLACK2
	CHPA	BB9999	COM	,T
	DEE	ELSE	DRB	,T
	ADD2	INCR1	COMB	
	STD	DEE	BRA	WHITE2
	BRA	NEXT	BLACK2	DRB ,T
ELSE	ADD2	INCR2	WHITE2	STB ,T
	STD	DEE	LEAY	BB ,Y
	LDU	-1,Y	CHPY	BY
	LINLP		BLD	LINLP
	VLINE	PULS		!RETURN

```

*****  

*  

* VARIABLES & SUBROUTINES:  

*  

*****  

*  

* MASK RMB 1  

* SEE RMB 2  

* SK RMB 2  

* BY RMB 2  

* INCRI RMB 2  

* INCR2 RMB 2  

* FINISH RMB 1  

* SSTART RMB 2  

* IORD1 RMB 1  

* IORD2 RMB 1  

* FLAG1 RMB 1  

* XCORD RMB 2  

* YCORD RMB 2  

*  

* BYTE RMB 2  

* PIXEL RMB 1  

*  

* YU RMB 2  

* YL RMB 2  

* XVERT RMB 2  

*  

* LDATA RMB 2 IX1  

* RMB 2 IY1  

* RMB 2 IX2  

* RMB 2 IY2  

*  

* DMSCDL RMB 1  

*  

*****  

* CALCULATE IN WHICH BYTE THE *  

* PIXEL TO BE SET/RESET LIES *  

*****  

*  

* BYTE PSHB 0  

* LDD SSTART  

* STD BYTE  

* LDA YCORD+1  

* LDD #32  

* MUL  

* ADDO BYTE  

* STD BYTE  

* LDD XCORD+1  

* LSHB  

*  

* LDD  

* SEC  

* ANDB BYTE  

* STD BYTE  

* PULS B,PC ;RETURN  

*  

* *****  

* CALCULATE WHICH PIXEL AND *  

* LOAD B REGISTER WITH MASK *  

* *****  

*  

* SPINEL PSHB A  

* LDA #CORD+1  

* ANDA #07 ;00000011  

* STA PIXEL  

* CHPA #00  

* BHI NEXT1  

* LDB #000 ;10000000  

* PULS A,PC  

*  

* NEXT1 CHPA #01  

* BHI NEXT2  

* LDB #040 ;01000000  

* PULS A,PC  

*  

* NEXT2 CHPA #02  

* BHI NEXT3  

* LDB #020 ;00100000  

* PULS A,PC  

*  

* NEXT3 CHPA #03  

* BHI NEXT4  

* LDB #010 ;00010000  

*  

* PULS A,PC  

* CHPA #04  

* BHI NEXT5  

* LDB #000 ;100001000  

* PULS A,PC  

*  

* NEXT5 CHPA #05  

* BHI NEXT6  

* LDB #000 ;100000100  

* PULS A,PC  

*  

* NEXT6 CHPA #06  

* BHI NEXT7  

* LDB #0002 ;100000010  

* PULS A,PC  

*  

* NEXT7 LDB #001 ;000000001  

* PULS A,PC

```

Word processor applications

Roger Merrick finds that there is more to MP than meets the eye

DOES the subject of word processor applications need an article, you may ask? Surely with a word processor, you process words. Depending on whether you use it at home or at work, this may involve writing letters, essays, novels, articles for computer magazines, reports and so on.

Well, these are more applications for a word processor than may immediately meet the eye.

DS-9 users will be well aware that Style can be used to prepare program text for BasicOS, A500, C, Pascal and so on. In a similar way, Dragon system's next generation can be used to prepare Basic programs.

have to come to. The resulting file can be loaded in Excel. This is definitely a better way and I would like to finish it.

Die doctorine

If the word *pinocchio* allows any form of read merging, build a multi-range flip of the basic tokens, left-to-right first, single left-to-right submerges. In the same order, build an equivalent flip of the next four basic tokens.

If a basic program is accidentally killed on a disk, use *DragonDisk's* *SHADE* command instead and display the sectors until the remains of the required program are located. The brighter folks can read the directory content and interpret the information to locate the lost file directly sometimes. Having located the remaining sectors of the lost file, they should be read into an array in memory, and then written to a data file on a disk. This data file can then be read into the word processor, and the *REVERSE* facility can be used to replace the basic names with their equivalents, producing a readable version of the program and facilitating the reconstruction of any lost/garbled areas. The resulting file can be stored as described on the *Basic* page above.

The *replace* statement handles basic token replacement. For example, the following statement replaces the word *Dragon* with *Unicorn*:

```
replace "Dragon" with "Unicorn";
```

The *replace* statement is useful for performing basic text processing. For example, the following statement replaces all occurrences of the word *Dragon* with *Unicorn*:

```
replace "Dragon" with "Unicorn" all;
```

The *replace* statement is useful for performing basic text processing. For example, the following statement replaces all occurrences of the word *Dragon* with *Unicorn*:

```
replace "Dragon" with "Unicorn" all;
```

Number line

In a similar way, a file of assembly mnemonics and their decimal equivalents can be constructed. Working preferably from a *cloc* based file, a machine-code file can be read into the wordprocessor and remerged with the assembly mnemonics file. Working from a *cloc* file is likely to be required as word processes cannot be moved around in memory, and potentially reserve all available memory for *cloc* based code.

Database

Many of the databases I have seen for the Dragon are highly restrictive about the way they can be searched. When initiating a search, to research a database of names and addresses, to find that I must specify an entire search string, not a substring, is

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is a name, and I search for Williams, depending on the database, I may get a "no records found" typical report. Perhaps I wish to prepare some information based on the location of addresses in the database, by isolating all those in certain postcode areas. Again, many databases will not cooperate with a desire to isolate all postcodes in areas B10, if the postcode field is 7 characters long. If I run this, the database may automatically fill in most fields for my extraction.

But with a little self-imposed discipline, data can be structured in a record processor in such a way that the record processor's search facility can be used to find every occurrence of particular strings. Of course, this is only a one-dimensional search, but many of the Dragon databases I've seen use this capability to search records.

The advantage of the word processor is that a search can be made of any search string that can be entered from the keyboard, from one letter to the word processor's search string buffer limit (words - lines) is 254 characters). A disadvantage of the word processor is that data can not be stored in either large blocks, whereas a database should read in a setting by string basis. In practice, many Dragon databases seem to read database information in big blocks anyway.

Another use I made of the word processor was to construct a yearly diary. Twelve files, each named for a month of the year, and initially consisting of dates 1 to 31/12/90 depending on the month, with the relevant day of the week appended (using block copy and repeatedly saving text under different filenames to minimise hunting).

I can then enter data as required, and use the word processor's search facility to find and replace any errors.

LITERACY IN THE CLASSROOM

Not many Dragon word processors have the facility to present alignment and orientation of figures. Mention is one, but it has matured (been strongly improved, says) and can be carried out within the word processor.

Conclusion

A word processor is a powerful and flexible piece of software, which lends itself to applications wider than simple presentation of text. With the limitations of DragonDOS, and the difficulties of transferring files produced within one application being loaded into another, a powerful word processor can perform many of the functions of simple text processing software, such as

Show us an alternative

Ken G. Smith makes a great journey into the Black Country to find the legendary Einstein, and maybe Dragons.

THE question I kept asking myself was "Is there a thousand trip off the hundredth index in order to attend the first ever Alternative Computer Show?" I have long believed that they may forward for us to form an alliance with users of another of these machines that the manufacturers of the computer trade ignores. When I first announced their event to be held in Birmingham, I felt that I had to go. The only problem was that journey. As things turned out even the morning fog did not get in my way and arrived in Birmingham only three and a half hours after I set out.

I have to say the directions in the advertising left a lot to be desired. Junction 6 on the M6 was far enough to find, but from there it was assumed that we would all know our way. It would not have taken much to post a few "to the show" signs, or at least include in the advert "follow signs for Aston Hall until ...". I spoke to several people who had spent half an hour or more trying to find the Aston Villa Sports and Leisure Centre. Those who did find it were rewarded with a great show with over forty exhibitors, of which unfortunately only four had Dragon-connections. I must admit that I did find this a bit disappointing, only one and Texas Instruments were there and service manager, which that was partly due to the unfortunate timing, the Weston show being only three weeks away. The event was originally intended as a Young Einstein show, probably mostly as it intended to include other machines. This also meant that there was little time to recruit exhibitors from other brands.

Since the mainstream computer press started treating the Dragon as if it was a four letter word, no Dragon users became a bit isolated and some funds that we are the only ones with enough loyalty and devotion to our machines to keep it going through thick and thin. Well, if you thought that, then you are wrong. The TRS80, for instance, caused producers long before the Dragon, but it still has an active, if small, user base and Droid, the organiser of the show, is a software house dealing solely with Dragon programs. The problem we all face about shareware numbers. Alone not one of us is capable supporting a show of any size, but together we can manage something big enough to attract supporters of monitors and printers, etc. The Aston show had about five stands allocated to each people. But price floppy discs were everywhere. Only when the 1989 Shows were really packing them in some three or four years ago did such people attend.

Several groups attended, even regional ones for the Bletchley, one each for the TRS80 and Acorn. Even the Jupiter Ace managed a group. The National Dragon User Group, however, while conspicuous by their absence. Of the four Dragon software dealers, not one had found any cause for complaint. John Peters said that even if he had not covered his costs (he thought he had) they still have been worthwhile attending. Prestons and Computerage reported a reasonable trade, though not as good as at Dragon shows. The four stand at real show from the past, Cap'n Marketing seemed to sink into obscurity some years ago, so it was a surprise to see them at the Aston Show. What was even more surprising was that they are still selling Dragon software, amongst other things, of course.

Everyone attending the show got a free copy of Micro Computer Mag, a fortnightly magazine mainly designed as a vehicle for advertisements, but also containing some interesting articles. The free ads for readers make it attractive and it is a relief to find a non-aligned magazine that does not treat Dragons as if they were brain dead.

I found at least one new friend at the show and stayed longer than I had intended. The organisers are already planning another, bigger show for the same time next year. This gives us plenty of time to arrange our stands in order to accommodate the crowd. Alone our shows can only get smaller. Collaborating with others will enable us to expand our market and make more people aware of the fact that we are still here.

Whether all these shows such as d'arcsoft are hoping to establish an excellent idea and one which will help to give users of older machines more contact and staying power. This is the first year that Droid have thought of dressing in other machines, and the strong, as Ken says, and as I have pointed out to a number of interested parties, was indeed unfortunate, as much so that a rumour was started that Dragon User was boycotting the show. This was far from the case, but we had an obligation to our stand or our support behind the Bletchley show, as which many Dragon dealers had already committed their resources. In four years I have great hopes that the Alternative Micro show will prove a suitable forum for the Dragon, and we will support them if they support us.

Breaking out in Chains

J R Sutcliffe tackles an old command.

Remember people have used the CHAIN command when they first got their disc drives and memory was gone up trying when their programs crashed.

It is a pity because if you can get it to work, it allows the possibility of 256 of data

with 160K of program in a 3270 Dragon, with hires screen and DQ8, and space to spare. The limit of the program size is the size of the disc. My experience with this command is the result of hours of experimentation trying to get it sorted into a put file, or converting a program which PCLOAD64 can run under Basic 4.0.

1) Write a module (PROG1) which clears string space, and dimensions all strings and variables, the last statement being CHAIN "PROG2".

This module may not be very large. One of the foibles of the Dragon CHAIN command is that though you can CHAIN smaller programs from larger ones, if you try the other way round, they crash. Put all subroutines within one PGM statements, up to, for example, 40. Many modules get to more than 40, just put the others till they are all equal. THIS IS VERY IMPORTANT.

2) Write the menu and other modules PROG2,3,4,5,6,7 when writing these, another string or variable is required, edit lines into PROG2.

3) Modules can chain any other module in any order. All data and variables are maintained, only the program is changed.

4) Sometimes the CHAIN command takes a long time (a few seconds). In order to prevent the impression of system crash, print something on the screen before you chain the next module. For example:

100CLS:PRINT"EDIT MODULE PLEASE WAIT":CHAIN"EDITMOD"

5) It is recommended in the manuals to do a string compensation FT=FREE at the start of each module. This adds to the time taken by 4, but is perfectly acceptable to prevent interference on the screen, and it does it. For example:

10 CLS:PRINT"INSTRUCTIONS FOR EDIT":FT=FREE
20 RESET OF PROGRAM

These delays are the penalties which we have to pay for having so much apparent memory. CHAIN needs to scan long lists of modules and their addresses check other and work harder when they are the same. The command CHAIN "PROG1" line is probably best used when separating an existing program. If starting from scratch, then writing of other modules as required after they are written if all modules start at the beginning, or make use of a variable which is passed. For example:

10 IF N=1 THEN 100 ELSE IF N=2 THEN
20 CLS:20
20 Rest of program

Since only one module is worked on, and saved at once, development can be much easier. Sloppy development only becomes module if there is a crash.

Now I have outlined the way of using CHAIN, it would be nice to find a batch of new programs making use of the new found space. Spread sheets, CAD/CAM, PCB design, who says you need 256K of memory to run useful programs?

Dragonsword!

Paul Grade gets his inspiration from a fruit.

(SO any of you remember those stories we used to read in just about every paper and magazine, the ones which used to rave on about the "Age of the Computer" and how only the current generation of kids would be able to understand it? The stories aren't quite so frequent now, and it's ages since I last read one about "Superkids aged 8 write Megabytes before breakfast and signs million pound contracts before lunch", but somehow the belief still lingers that anyone old enough to buy a computer is old to understand computers.

I often wonder how such myths get started, because if the members of the PCWU are anything to go by, that one couldn't be more wrong. We have about three-hundred-odd members of twenty who are amateur programmers, and a couple of those are what I would consider to be professional class, but we've got the same number who are over seventy, and while they may like to think of themselves as youngsters, I don't think they quite fit the image that the media was trying so hard to push. Most of the "professionals" in the group come into the hobby by a fluke, range, and although most of them aren't writing commercially for the Dragon, they earn their living writing for far more complex systems, so where does all this rubbish about "Superkids" programmers come from? And why did it start at all?

Personally, I think it begins as an attempt by computer manufacturers to convince parents that their beloved kids would end up unemployable and begging on street corners if they were deprived of a 2860 or an Amstrad 4000 on which to learn these new mysterious skills, which alone could see them on the road to fame, fortune and an Amex-Gold card.

Convincing tale

There's nothing new about that kind of sales pitch... it's a well-proven fact that most parents will buy their kids anything they think will give them a better start in life, even if they can't really afford it... you've only to look at the pre-Christmas TV advertising to see how well it works. Of course, it is a double-edged line too, because most kids are bright enough to play along with it, and when they get their new toy (young computer), they usually make a pretty good job of convincing parents that they are brilliant programmers, even if their ability really only extends to flogging in the latest *Wolfquest* hypergame (downloaded for PD from the original VHS tape).

So what am I telling you for? Not, as you expected, in an attempt to bore you to death, but in the hope that someone out there on the other side of the keyboard might be able to tell me the answer to the problem which is rapidly killing the home computer scene. If the brats aren't learning

to program, or to write about the subject, and the "professionals" are all engaged in making money in the far more profitable "business" market, where is the home computer material going to come from?

No kidding

I don't think I'm making Editorial Disagreement when I say that even user groups and magazines are short of informative articles on hardware and software, and software distributors have reached the stage where they're virtually nothing new to download. After an edition's disagreement, *Dragonsword* are lucky, because we've got some very good people, and a well-informed following, who come up with a steady stream of information and user news (unfortunately *Charnwood* and my disagreement is finding it's difficult to find any authoritative information on Amstrads that it's having to take insults with a smile. This is because the younger users aren't learning fast enough, and the experienced ones are all concentrating on making a living. However, your comments on software distribution may be met with a fair of disagreement as, after a long time when everybody was discussing the lack of colour-packaged magazine-creations, they've got them all together and are producing nice, inexpensive material steadily.

It would help schools did more towards helping kids to learn basic computer parts, but there doesn't seem much chance of that happening. Although these are exceptions, most seem to rely on teaching the kids which keys to press in order to run ready-written material, which is like teaching them to turn on a light and taking it electrical engineering.

Fortunately, there are still a few kids who don't believe all they're told at school, and some of them hack away at their computers at home until they can make it obvious they went without having to rely on someone else's brain, but they are few, and they usually get little or no encouragement, and usually know how to give up because they are always being told to "stop messing about on that computer and do your homework", for people who can't see that exam passes merely demonstrate the ability to pass exams, not aptitude at anything useful.

What can you do?

So what can you do? Well, if you're still at school, you could try teaching yourself, rather than telling yourself that "Computer Studies" will teach you everything useful. If you're more patient, you could stop complaining that I'm too old to learn that sort of thing and have a go at it. (My

father-in-law is 80 and he's got his first computer this year. He's teaching himself to program. He says the evening classes help a bit, but what you really learn from is using discontinued stuff. But I hope could then pass on what you know to others of all ages, so that they have some incentive to learn. A little help and encouragement can do a lot of good.

Computing isn't a spectator sport. Sitting around playing with some else's program is about as instructive as watching *Neighbours*. Learn to write your own programs, learn to make, repair, and adapt your own hardware if necessary, and you'll find the whole thing becomes a lot more interesting.

I'm not suggesting that you shouldn't buy software, but that you should read the stage where, if the program you need doesn't exist, you can write it for yourself, and if your Dragon expires in a cloud of smoke and a screen full of garbage, you at least know where to look, even if you can't fix it yourself in the final analysis.

Well, I know, if I'm so good, why don't I do more about it myself? Fair question, but I don't really know that more than do. Running *Amstrad* takes over thirty hours a week. I've received more *Dragonsword* and *Amstrad* reviews than I can remember, I do my best to answer any enquiry or sequence a review, and write the odd or downright popular page for *CD*. Use each month, *Charnwood*. I try to nudge people into realising that owning a computer is not quite like owning a video recorder. It is a fast way machine. It may not make very popular, but it gets better results, and it hopefully stops a few people out of their complacency long enough for them to start thinking about what they can do with their own resources, which in some cases is a whole new experience for them!

Tell me if I'm wrong

So that's why I don't run a software company, or do some of the other things I would like to do, because I don't have the time left to do them in. Anyway, you know *Dragonsword* don't you, so why should I deprive you of your chance of fame or notoriety?

Plus, I do get tired of keeping an eye on people, but someone has to do it, and I got elected a long time ago.

By the way, if you are still at school and think I'm being unfair to your or your school, and that you really are a good programmer, and they really are teaching you something useful, write and tell us. I'd be pleased to be proved wrong. If it isn't really that, just people I'm an idiot.

By the way, every letter that I've had in response to this column has been in agreement with my comments, and said like to hear from those who DON'T agree as well. (We did get one, Paul. See Letters Page).

Expert's Arcade Arena

HELLO! I know you're dying to know what's in the column this month, so I'll waste no time. It's nice to be back on my keyboard again, and thanks to my editors for keeping it warm while I was away. However! Hasn't there been a lot happening recently? Quicksilver disappearing and then Paracode, Radio One has gone silent, Neighbours has grown even more nauseating, Dragonfire and Orange have gone and isn't Mandragore good, but the big news is that Dragon User has moved (We can see how long has been away - ED). I'm a bit anxious about the initial wallpaper on the walls of my new office. Anyway, don't forget to send all those letters, comments, car keys, cigarettes, bottles of gin, proposals of marriage and the rest of the gifts in the right place. (Send to the *Editor's* office, at the rest of the *Editor*).

So, to business, and in this month's column you'll find all the trivia and jokes and poems and cheats that I've always found in these pages. Poems this month include *Muspell* (does anyone know of an infinite level power for Muspell?) *Exorcist* disappears when you play the "Mystinger" screen (Clephant and Guardian Angel, to which I send my thanks to Michael Dunn - Melo, Michael, thumps - and there'll be more from him in the future). Absorbsome is a feature in which, in the style of other great gurus who answer questions from their beloved public, I'm going to call "Expert on the Spot". Randomly questions and answers to EOTS, however small and trivial, or potentially important for the survival of the human race, and I'll answer them as soon as you can stop *Interrobang* in Portugal.

Poems

Medieval ... (C) 29 PEGI 2000/2001 (16+)
Clephant ... (C) 29 PEGI 2000/2001 (16+)
Guardian Angel ... PEGI 10/12, 16/18 (16+)

Here's the first problem for the Expert on the Spot, from Keith Forsey: "I have now

located Downstalker - this guy's got a superhuman patience barrier - and have been slacking my own screens with the editor, but what puzzles me is whether the screens I design will be saved to tape?" Parallel to us is the "S.E.G.U.S.T.E.R. ENTER/ALERT/HOLD" cheat for downstalker (oh, so that says, you can't save the screens). To save the screens, you do in fact need to splash a bit more cash and buy an add-on, known as *Snapshot*.

As far as I'm concerned, to be asked to give away yet more of your hard-earned pennies just to add a few minutes of program seemed a little too much, so I haven't invested in the tape. I gather *Snapshot* is now supplied by Orange Software (although their version may be different to the original Macintosh version) - if anyone out there knows, why not get in touch and let me know? *Snapshot* is also available for £1.80 (by the way, all this information can be found on the Website of the *Map* (http://Dragon User). Orange is quite a busy company these days, and keeps releasing new products, so please support them and help them establish themselves in the market place. He can't afford to lose any more Macintoshes or Quickbooks and Orangebox seems become a vital link in the future.

Yo-haw

Now then, a quickie from Eric Hobby. He wants to know why his "recently acquired" copy of *Mobile Man* crashes every time it loads. Are you sure it's not a *Tandy* version? Otherwise, my copy always works, so you know, mate, it looks as if it's still. Don't buy from the cowboys in *July* - and take a step on the wrist. Here's one for you lot to work on, also from Keith: "How do you get off the last screen of *Catacombs*?" Hobo has sent me the game yet, so I still can't help. Are my hands really too weak? More EOTS next year (That's *un*cool, *dear*. In case that's still too subtle.)

Address: "The Expert" at Dragon User
18 Alexandra Road
Hounslow, Middlesex TW3 1HE

Right, now onto a letter from someone who's obviously keen to make new friends, as they begin "I hereby claim the Expert's Arcade Arena be the most unchallengeable in the entire history of Dragon User" (See right). Who wants predictability? Apart from me, obviously. Ed! Next, thank you for your kind comments on *Editor*, for words which will stay with me forever, amongst the other precious memories of this, the high point of my career. Ota also makes amends by providing the cheat procedure for *Robotpolis* (see *around*). My thanks to Ota, who was actually writing on behalf of the *Dragon Companions* (the Scandinavian user group), and thanks to all you over there in Norway.

Robotpolis Cheat

Press the "X" key during play. The code is DESTROY

By the way, if anyone managed to miss MacGowan's "advice" for *Macmillan Mine* in the September *DU*, then go back and cast your eyes over it. *Breakfast* for a welcome change, in fact, unless I could send them a prize for plain, cold honesty. Macmillan then could start a chase among advertisers, and we'll see them fighting each other by criticising their own products - and why not, it's worked for British Rail and Marks? (Who? ??). PS. How about a copy, Mac?

Well, it seems that that's just about all there's room for in this mag for this month (can you read any blank pages?) (Don't say such things! This is tempting fate...), so I'll better see *Chapman* sooner or later (and believe me, I'd sooner it was later than sooner). Finally, however, let me tell you that you'll better read *Macmillan Mine* because loads of volunteers, even as I speak, are counting your noses in the software survey. And if the round-the-clock schedule goes according to plan, the results should be ready for life-to-go public next month. May the Good Lord help you sleep between now and then. Bye and Merry Christmas.

Communication

Problem: Wanted: Dragon's Egg and Snap-Damns.
Name: T. G. Gaskin
Address: 16 Ealing Drive,
Stoke-on-Trent, ST3 5LR

Adventure: Medium (Radio Raid)

Problem: Can only get green key and recover from adventure.
Name: Kevin Barrett
Address: 108 RHE, Edinburgh
Airport, Virie, Scotland.

Problem: I lost my instructions for *Dragon Composer* and I can't re-create it properly. Can anyone help?
Name: Colin Davies
Address: 2 Greenhills Road,
Culcheth, Warrington, Cheshire WA2 8HZ

Problem: Wanted, *Eric-Cat* spreadsheet, also *Dynabase* computer. Both for DragonOS.
Name: T. C. Hanson
Address: Tel: 0279-580564.

Communications

Send down your problem on the coupon below (make it as brief and logical as possible) together with your name and address and send to: Communications, 18 Alexandra Road, Hounslow, Middlesex TW3 1HE.

Problem

.....

Name

.....

Address

.....

Write: ADVENTURE

Pete Gerard slips naturally into a role

NEXT door's hallward seems to have survived the postal strike, judging by the phenomenal amount of mail it was mailing only the other day. The cause of this noise is not known, although I note with some trepidation that there is a large pile of scaffolding outside the nearby public house, while no explanation has been given for two days. Mind you, precious little can be seen at all today. It is ideal role playing weather.

There is a liberal coating of frost covering everything, it is extremely misty, thus rendering the cemetery on the other side of the road invisible, and it is very, very cold. Cemetery? Yes, however, a cemetery. Definitely spooky it can assert at least as well, like on dark, stormy nights when a low wind covers the ground and only the tops of the gravestones can be made out in the eerie half-light. Someone once remarked that next door's hallward was lurking "in the ranks of the dead". I sincerely hope that is incorrect.

In last month's issue I gave a brief introduction to role playing games, but there are many other aspects of this fascinating trend in adventures that have yet to be looked at. Quite a few traditional adventures have had characters in them, or "pegs" to give them an official name, but these characters are to be found in abundance in role playing games, and just as early adventures are forced to beat each other by having their players locations, so modern RPGs are wandering along a similar road by trying to claim as many characters as possible into a single game.

I recall K. Hulden's new adventure, *The Curse of Cormar*, is strong on characters, and includes such delights as an elf, a hawk, and a centaur. Cheesy, overblown locations as well, which can't be bad, and text only to boot. Now this would be a good person to write a role playing game, and push the dear old Dragon even closer to the limits.

Role playing games

Characters in RPGs can usually be divided up into good or bad. The good guys will, at the very least, ignore you, but others will undoubtedly try to varying degrees. Since most RPGs are, at the moment anyway, mostly slight variations on the traditional Dungeons and Dragons theme, something that will come back to later, the good guys are almost invariably along the lines of wizards and elves. The bad guys will, at the very least, only put up a pretense of fight, but others will be doing their utmost to destroy either you or members of your party. Again the Dungeons and Dragons theme is strongly prevalent, and the usual assortment of orcs and batrags

lump around with other, lesser, upstarts.

Bartering is usually to be found somewhere along the way, and the status of the character that you're bartering with, whether they be good or bad, will determine everything. Not least, of course, will be to see if they can be bothered to deal with you in the first place. They might instead push you away and ignore you, but eventually you'll get round to doing a spot of bartering with someone of status later.

Careful with ghosts

There's an important rule to obey when bartering in an RPG: never be ridiculous. That is, if an object costs, say 500 golds, don't go offering to trade it. The character that you're dealing with might be highly ungrateful, and if your tank bad mannered produce a most clever form somewhere and effectively end the game. You might be lucky and escape with a warning, but then it will probably take you many moons before you're allowed to attempt to barter again. Always try something reasonable, like 400 golds, and take it from these. You'll probably end up paying around 400 for whatever the item might be, and a saving of 50 golds on the original price can't be bad. 10 percent off, well worth bartering.

Another rule applies just as much in RPGs as it does in adventures: always leave your position before trying anything dangerous or foolish. Inns and taverns usually pop up in an RPG, and these you might be offered all sorts of delights to tempt your palate. Drunk and madd are evidently there in one form or another, but it's probably safer drinking water. I've played one RPG where it's likely and have to much drinking whether you get drunk and cannot perform anything effectively. Reasonable enough, you might assume, but in this particular game it was not only the character who got drunk. So did the computer! At first I was convinced that the blessed thing had crashed, but as my character gradually recovered from the effects of his/her/its self the computer. An interesting experience.

This getting drunk in taverns lark is just one area where RPGs score over traditional adventures, because there seems to be a much closer-to-reality. You get a more vivid impression of actually being there because your character gets hungry and thirsty, or tired, and needs to eat food and water and possibly a bed for the night. I know that some adventures have tried to do this, but it never seems to work in the middle of an adventure game when you're trying to puzzle out how to get across a yawning chasm. There is less concentration on problem solving in RPGs, or so it seems to me anyway, and more effort is

spent on convincing the player that they really are there, trying to work out how much money they've got and whether they can afford an expensive single room or a cheaper dormitory one and then the risk of being robbed in the night.

That is not to say that problems don't exist, because they most certainly do, and in great quantities as well. It is just that the problems are, generally speaking, of a different nature from the standard "insert pallor card in slot and pull lever" variety beloved of the adventure game writer. The problem of a room for the night, for instance, as mentioned in the previous paragraph. Checking in at the wrong place could be a potential disaster, although it is something that can be done rather than a problem that prevents you from getting any further on in the game until it is solved. Thesis, methods, has another great virtue of RPGs: there's always something to encourage doing, you can always have a room around and see what lies beyond the next corner, you're not stuck in front of a yawning chasm without a plus to it to provoke get action.

Time marches on

RPGs often tend to play themselves as well. That is, if left to their own devices and the player doesn't press any keys and instantly re-loads, the characters within the game will automatically fill up their own account, time will pass, and various events dependent on time will also happen. Inns will open and close, and if you fail to get a bed for the night and have to sleep out in the open then that's your look-out. Once again, this sort of thing has been tried in more traditional adventures, although it always seems under to me that time makes many convolutes you're still working out hours get across that stretch of chasm.

But here we come back to what I think is the one major problem facing RPGs at present, and it is not a situation that early adventure games were through and to some extent are still facing themselves. Just as early adventures seemed to be nothing but copies of the original *Colossal Cave* (and I was as guilty as anyone else when writing them), nowadays so many of the more popular RPGs all look remarkably the same. They're not the same games, you're not in front of the same situations all the time, but there is a clear resemblance from one to the other. All the comments made on her about bartering, good guys and bad guys, inns and inns, could apply to any one of a hundred RPGs, and it is to be hoped that someone (you?) with a bit of originality can manage to break out of the mould and come up with something completely different. We might look at a few ideas next time around, but

line, the news.

Our beloved editor hath spoken, and foolish be the man who ignores her words. So, from next month onwards, there won't be two separate columns as there is to be the moment, but instead there'll be one big column. This makes sense, because there is often a carry-over from one to the other,

items that appear in the Adventure that could equally as well appear here, or vice versa, so from next month it'll all be lumped together but probably still called the Adventure that. Now here's where you come in. If there's anything you'd like known in this new section, please write and let me know and I'll do my best to incorporate the

changes, either better suggestions. What you get will then, to a large extent, depend on what you want, so please put pen to paper or finger to keyboard and drop in a line. Or yes, and if you've any suggestions for ingenious ways of quietly disposing of belligerents, then I'd love to hear them. Until next month then...



I seem to have stirred up something of a Dragon's Lair with my comments in the September issue of Dragon. User when suggesting the setting up of a nationwide Dragon adventure swap-shop, I received an extremely pleasant (and extremely long) reply from our old friend Jim Frey in Florida on the very topic, letter entitled "Central Registration" (888), in which he concluded as much as possible, but only now realising the glorious pages of our (and I must stress the *our*) magazine, was of any magazine. Such are deadlines, the bane of any editor's life, and any editor who can include in one of her letters the amazing comment "we can take some of our newly acquired snails and introduce them to the Welsh marcher" can only be admired for putting up with these things.

that by doing so are we then making potential new suppliers of Dragon software think twice about coming into the world of the Dragon? Let us, in the honourable British tradition, arrive at a compromise. If an adventure game that was once produced by a thriving company exists beyond the commercial life of that company and becomes impossible to obtain, then we can assume that unless the author decides otherwise we are free to make backup copies and swap them amongst our friends. Such a program, along with programs that are put into the world of public domain software, will then once more become available to the Dragon community if that program is subsequently re-marketed by another, existing, company, then it no longer becomes one that can be swapped in the aforementioned manner.

To sum up, then, if anyone is no longer being marketed in any way, shape or form, then we can make it available to all members of the Dragon community. If at any time it is either being marketed, or someone else takes up the marketing of it, then we can't. Sounds simple enough to me, and I trust that Jim and others will appreciate. So, if anyone has any Dragon adventures that are not being marketed, not being sold anywhere, and they would wish to share those adventures with other Dragon users, let us know. If I or anyone else subsequently discover that the game is being marketed, the boy will be around to do unspeakable things. Failing that, Hitler and his snails (assuming they survive the Welsh marcher) will transform your life into a nightmare.

Classics

By the 'way, that was all very serious, I know. But it is a serious topic, so thanks to Jim and his letter I hope we're encouraged to get everything sorted out to the satisfaction

of all concerned. And now, back to Dragon adventures, and two classics.

Now, just here for the rest of this column, Readers with exceptionally keen eyesight will have noticed a map attached somewhere near this column, but we shall come back to that later. To begin with, a friendly letter from Andrew McFarlane (and a quick hello in another letter from Peter Hayes, the Mystery old adventure genius in September of 1987 who is now the 18 year old adventure star of 1989 — hello there) concerning the game *The Final Mission*.

The Final Mission

Now, however, ever vigilant readers, because what you are about to get is the **COMPLETE SOLUTION** (as some famous bishamans or others might have spent in. Yes indeed, the **100%** this is what the final message needs solution. Mine checklist, you have to check. BUT, the game is written in Basic and so that makes matters simpler. I shall quote Andrew's letter to you:

"About two months ago (four now, postal strike still operating at the time — PGJ) I wrote to Incentive Software and asked for a solution sheet to *The Final Mission*. I received a solution sheet and thought it would be easy to complete. **WRONG!** For some reason there is no solution, and you need to drop the screen so as to kill the spider. I have searched everywhere for this screen but have had no success. About two days ago (yesterday now — PGJ) I found out that the Kali adventures are indeed basic. This is what you have to do:

Load the program as normal, when the computer goes 'click' (signaling that it has finished loading the program and is now loading the data), reset it, then type the following:

a **DATA FILE**

You then may **EDIT** onto, press **X** and

delete out "GOTD 1000". All you have to do then is type RUN. The solution follows:

This is Andrew's full solution now, as read as far as you need to (or there) because I am not typing all that lot out backwards in the time-honoured fashion: it would take forever! (John is someone going to come up with a program that automatically transposes any quantity of copy lots reversal??!!)

Not backwards!

(1) Get chair; examine chair; east; drop chair; stand on chair; break glass; east.

(2) North; get straw; east; south; drop ring; east.

(3) West; east; east; west; west; south; get garnet; west; south; west; west; south; get diamond; west; south; generate; north; east; north; east; north; west; north; west (boot should open trapdoor).

(4) Down; east; south; south; black gag; north; north; east; remove panel; east; north; drop gag; south; east; get sarcophagus; west; east; south; south; west; west; west; up; west; west; west; west; west; west (you should hear sulphurating sound); drop soap; down; north; north; north; west; west; south; south; south.

(5) Unlock door; drop key; south; an more (or escape); south; south; south; say "transistor"; west; say "gar"; east; south; get pendant; insert edge; wear pendant; south; west; north; north; west; east; east; west.

say "2657"; south; south; south; get carrying; west; south; south; west (this is where you should drop the scarf); share-aerosol; spray aerosol; down; south.

Use cockpit; drop cockpit; north; east; down; down; unchain man; get handle; up; up; south; south; get robes; insert diamonds; south; south; shoe; examine (make sure you are wearing the pendant with edge in it); south (the pendant will launch the electron back to hell); insert handle; south. THE END!

Andrew tells me that if you save or load the game you will not receive the full 100% and you will not get the final part of the secret message, however, having completed all three Kat achievements the secret message is EE (aaarghmmhah!) - sound of Andrew's voice being hushed up)

Solution sheets

Last bit of news from Andrew is that he has prepared an A4 booklet with hint sheets and solutions to *The Crookedwood Incident*. Telephone: Syringa Apartments 477, Demontfort, Lough Space, Mountains of Kat, Temple of Chen, The Return of the King (and map). This costs £1, including postage, and can be obtained from Andrew McIlroy at 108 Main Street, Little Harrowden, Near Wellingborough, Northants, NN10 8EA. Once off, not bad!

Meanwhile, back at the map, Ryel Whistler (Univers 22) you will note, another

Dragon User Exclusive (paper), brought to you courtesy of another Dragon stalwart, Nameless Duke Joe-Boncud. I think he must spend his entire life playing this game *Angrypig*, he has mapped galaxy one of universe four of Total Eclipse, and a million blessings on him for doing so. (The map has suffered a bit in the post, so bits of it are not perfectly legible, but we'll have a go at reproducing it, and if that doesn't work, we'll try again sometime. Ed) Saving a position is possible, reloading is not, which is a major problem, so one can only stand back in amazement at the perseverance that this man has. An *angrypig* magazine was not enough, Joe has had to *argue* with the stuckin-Universe-OH and his editor "all they have to do is send an SAE and no money".

Wishful thinking

After all, this is a game & not a business transaction. "Goodness, Joe lives at 73 Ammunition Street, Hamrun, Malta, for those who don't know. He tells me that Malta has to have a Ministry of Computer, which houses They're-right-but-not-the-Dragon-Professional one day (useful thinking here). He says that lots of his friends would like to see the PC version arriving, and he wishes a Happy Christmas and Happy New Year to one and all. What more can I add? Have a fine '88 everybody, and let's keep the Dragon Motorcycling (TM) rolling over the next twelve months.

Letters

This is your chance to air your views — send your tips, compliments and complaints to Letters, 49 Alexandra Road, Hounslow, Middlesex TW3 3EP

Wordwrap workout

CONSIDERABLE time must have been spent by people writing test adventures or screen instructions for programs to ensure that words do not wrap round to the next line (it

isn't that) Often, when I think I have it right, I find when the program is run that I am cut by one character and the program has to be re-entered.

The following program segment and sub-routine will take care of the problem. I offer it in the hope that it may be useful to other Dragon users.

```
100 FOR A = 1 TO B
100 READ AB
100 0303UB 3080
100 0B 07 A
100 DATA (space), (space), (space)
2000 REM — WRAP-PROVING
2000 REM — SUBROUTINE
3000 Y = INSTR(1,AB," ")
3010 BS = LEFT$(AB,"")
3020 IF BS = "" THEN
3030 IF LEMBS = 0 THEN
```

```
3040
3050 IF LEMBS = 1 THEN
3060 0303UB 3080
3045 L = LEMBS+1
3055 IF RIGHTS (BS,1) = 1 THEN
3065 BS = LEFT$(BS,1)
3070 ELSE 1 CHR$(BS,0): BS:
3070 X = LEMBS+Y
3080 A$ = RIGHT$(AB,X)
3090 IF A$ = "" THEN 3080
3100 END IF
```

OR,

```
3010 IF LEMBS < 0 THEN
3020
3030 END IF
```

Notes: B in line 100 is the number of DATA items. The sub-routine? has been used for PRINT throughout. The semicolons (;) are essential. Strings of any length up to the maximum (255 characters) may be used. There **MUST** be a space after each DATA item before the comma, and there **MUST** be a space before the closing " ". If the alternative below is used, double the spacing can be obtained by amending line 3030 to:

```
3030 IF LEMBS > 0 THEN
3040 IF LEMBS < 0 THEN
```

(To make the above program work, add the line 200 S10P)

Alternative lines 100-102:

```
100 W$ = "sentence 1"
101 X$ = "sentence 2" (etc.)
102 A$ = W$ : GOSUB 3080
103 A$ = X$ : GOSUB 3080
104 A$ = Y$ : GOSUB 3080
105 A$ = Z$ : GOSUB 3080
106 A$ =
```

(The double quotes ("") cannot be used within strings in the alternatives in lines 100 on.)

Where several semicolons of text are required, or where less is required several points in a program, the sub-routine can be called on repeatedly.

With modification, the sub-routine could be used to print columns of text on a printer: PRINT would become PRIN#1, 1-1, POS#0 (and the value in line 3080 would be altered according to the column width required.)

J M Cawthron
Church Farm Cottage
Blairstown
via Market Harborough
Leicestershire LE12 8SD

Excerpt from an epic

THIS is a rag bag of a letter and I hope you'll bear with me while I type a number of thoughts out of the way. (1 ... 2 ... 3 ... 4 pages). This is no rag-bag, Jim, this is a paper mill!

I was floored when I found my letter in September's Dragon User and read regally for the Armstrong bemusement. Nothing happened. Now, I have learned never to argue with an editor. No. That would clash with the doctrine of Divine Infallibility. The other possibility is that you are waiting for me to say what I would like. May I say I would welcome anything that is not an arcade game or a test adventure, and the more obscure and offbeat the better. (Oh good).

Jim Fenton
11 Linden Way
Hornbeam
RM7 8PU

Cereal data

Gordon Lee uncovers some startling factorials!

ON this page in the past we have made reference to "cereal" competitions. By this I mean those competitions - frequently found on the packets of breakfast cereals - in which it is necessary to arrange a list of desirable features (usually relating either to the program offer, or the cereal) in the order decided upon by a panel of judges. To be certain of winning in a winning line, how many attempts would you need to make?

Let's assume that there are only four features on the list. We would need four attempts to be sure of placing the features. This would leave three options remaining for second place, so we would need three more to be certain of correctly placing

the first two features. Proceeding in this way, it is clear that all four would need a total of 24 attempts. This value is known as "Factorial" 4 and is written as $4!$. This exclamation mark listing the symbol for factorials. A list of some of the lower factorials is given in Table 1. Note that 0! is listed as 1. There is no logical reason for this, as 0! is a meaningless quantity, but by convention it is given the value of unity and by so doing many formulae using factorials can be simplified. However, this is a subject which need not concern us here.

The 3431 digits in Factorial 244

The first two features. Proceeding in this way, it is clear that all four would need a total of 24 attempts. This value is known as "Factorial" 4 and is written as $4!$. This exclamation mark listing the symbol for factorials. A list of some of the lower factorials is given in Table 1. Note that 0! is listed as 1. There is no logical reason for this, as 0! is a meaningless quantity, but by convention it is given the value of unity and by so doing many formulae using factorials can be simplified. However, this is a subject which need not concern us here.

Returning to our cereal competition, the organisers are seldom generous enough to list only four features. A more

usual number would be 8. Reference to the table tells us that we would need to submit 60,000 entries to be certain of getting that winning line. If the number was increased to 10 (as was the case with a recent national competition over 479 million entries would be needed) - and they even asked for a tie-breaker! (The exclamation mark at the end of the last sentence was, in this case, not intended as a factorial symbol.) Clearly, it can be seen that as the factorials increase they get rapidly larger. For example, 50! - the number of different ways that a pack of cards can be arranged - is a 50-digit number. Look up factorial 50 in a book of mathematical tables and you will generally

Prize

WE LI, here we are, saved from ploughing the digits (and not to mean anything) of the Magic Numberless Box by John Pester of Kanga Software, who used today to say that, having promised us five copies of the greatly lauded *DragonAge*, he reckoned he would manage another five. And we didn't even have to break his arms. Come to think of it, just as well we didn't, or he wouldn't have been able to write it, would he? The aptly-titled arcade challenge has been pronounced the best game of 1988 by many, and is a generous contribution from a software company in its early days.

Rules

When you have entered the "cereal" competition, postcard into an envelope marked JANUARY COMPETITION with your answer listing any comments you care to add, and send it to us at Alexandra Road. No cheques, please, unless they

contain rare recordings of Led Zeppelin. Then add the postcard to come.

Taking of ourselves, what about the factorials? All just. Using your skill and judgement, please list five things you like about Dragon Age in order of importance. Think carefully before answering this. You may enter as many times as you like.

October winners

We allowed a certain amount of flexibility in the final solution, as many entries came up with slightly different answers by perfectly fair means. However, it wasn't difficult to pick out the most confident calculations.

The winners are: E.A.Neuman of Addlestone with a particularly far-reaching set of comments, S.A.Sidson of Chiswick, D.J.Grey of Milnesborough, Patrick Hill of Castlebar Beaches, P.O.Maddocks of Taplow, Peter Duncombe of Harpenden, Paul Woodson of Wotton-under-Edge, Fred Wilson of Hemfield and last but not least Austin Henderson of Bramsgrove, who

beat several other entries of comparable brilliance on the strength of his answer. They may not have won us over to 10th place. (The case does not necessarily argue in order of success, but the battle for 10th place was definitely joined here.)

Austin's submission involves using indoor football because it doesn't make him out of breath. We had a few this month... I understand football better than indoor football because the trainer doesn't use a nasty cold sponge for fear of spoiling the carpet... because outdoors I get the breathing... I'm playing the most gifted rugby players in the country... because getting muddy... Drag on my social life... because it's difficult to play Dragon in an outdoor football pitch (good one, that). Fundamentally true on all counts... because I won't have to go to Coventry to win my Spur... and so on. All good stuff.

Solution

See opposite.

Find the value given as 0.000001 (0). (The number in brackets meaning that the decimal point needs to be moved 6 places to the right to obtain a value of the correct magnitude. Of course, this will not be the true value accurate to the last digit, but it will be sufficiently close for most practical purposes.)

The calculation of such high factorials is generally restricted to the researchers of the numerologists. However, a number of solutions have been found which relate to factorials. In 1978 a Frenchman, H. Boudet, noted that 41, 16 and 21, when increased by 1 became perfect squares. Using the methods of calculation then available he was unable to find others with this property, and so he conjectured that these were the only ones. Now, a century on, computers have taken the calculation of factorials far beyond any that Boudet would have considered possible - still

without finding any more to add to the list. The value of π is interesting in that it has a square number of digits, and can thus be printed in square formation. Other numbers with a square number of digits are the factorials of 12, 18, 20, 30 and 31. (All values under 1000). There are just 29 that can be printed in this way, the highest of them being 544! which has 2401 digits. For numerically curious, this value is given here.

Another problem relating to factorials involves finding numbers in which the factorials of each individual digit adds up to the number itself. Apart from the trivial solutions of 1 and 21 there are just two possible numbers. One of these is 145, since $1! + 4! + 5!$ also equals 145. I will leave it to interested readers to calculate the other value (using a silicon computer program if necessary). However, there is a slight catch which has already been allu-

ded to on this page!

This month's competition also involves factorials. Examination of the list of factorials in Table 1 reveals some oddities. Notice how the number of zeros at the end of each value gradually increases. These are cumulative and will increase without limit. For instance, the value of 644! shown here ends in 203 zeroes. Not so predictable, and hence more curious, are the repetitions within the factorials of other digits. Note the run of four consecutive 9s in 211 and the four 8s in 2111. Other factorials with four repeating digits are 201, 261, 401 and 961. Even more unusual is the factorial of 151 which has six consecutive 0s amongst its 293 digits. Now what we would like to know is the smallest factorial with seven digits unique, and can you say what the digit is? Remember we are not considering any zeroes (even if they occur clearly from the right-hand end of the value).

The Answer

THE Wallis and Leibniz formulae do not compute the four digits of pi until the 1000th and 1400th steps respectively.

Using the listing to generate Wallis' series, the approximations for the first five values for pi are given as:

```
4
2.000000007
2.000000006
2.000000005
2.000000003
2.000000002
2.000000001
2.000000000
2.000000000
2.000000000
```

From this it can be seen that the first digit - the 3 - is not computed until the 100th step. That is, after the ninth step it remains as 2 and does not revert back to 3.

The listing given uses a subroutine which looks at the computed value of pi and compares the digit being tested with

This is Gordon Lee's own
solution to the December competition
see page x for the results

```
3 178=7*1, 144=7*20+4=21*7
10 8=2*4 8=8*1 8=8*1 8=8*1
20 2=2*1
20 144=144 144=144
40 8=8*4 8=8*4
50 14=14*1 14=14*1 14=14*1 14=14*1 14=14*1
60 16=16*1
70 20=20 20
1000 21=21*100+1 21=21*100+1 21=21*100+1
1000 19=19*1 19=19*1 19=19*1 19=19*1
1020 19=19*1 19=19*1 19=19*1 19=19*1
1030 IF 19=19 19=19 19=19 THEN 500=500 1040
1040 PRINT 19=19 " " 19=19
1050 19=19 19=19 19=19 19=19
1060 PRINT 19=19
```

the actual value of the digit at that position in pi yet. Once the required digit has appeared in two consecutive assessments, the relevant values are printed out. The same routine can be used on both of the formulae as follows:

Add line 5 which defines the extra

variables.
 Amend line 20 to read 20=GOSUB 1000
 Add the subroutine (lines 1000 to 1060):

This is shown with the Wallis listing, but the procedure is exactly the same for the Leibniz formula.

Classified

DRAGON 384, disc drive and controller, printer - Tony Daffos, cassette player, some games, utilities, all books, books etc. All 1280 32 J Waddell, 38 Willow Walk, Liverpool, Merseyside, L19 4JU.

DRAGON 32, super Dragon. Winter cartridge word processor, used program, manuals, £40, Bognor, 01 421 0889.

DRAGON SPARES, computers, monitors, ROMs, MPMs, MPUs, and many other items. Repairs, upgrades, B&B for test. No 80a, 29 Eaton Way, Great Tewham, Essex CM9 8EE.

DRAGON 64 (256+), Alldrives, 256-colour cartridge, Super-CDS chip. Lots of books and software on order. Complete set of Dragon User from no. 1. Offers, (091) 585 5571.

HERE'S MY CLASSIFIED AD.
please write your copy in capital letters

Name _____
Address _____
Telephone number _____
Classification: Dragon user.
Please cut and send this form to Classified Department,
Dragon User, 18 Alexandra Road, Bognor Regis, West Sussex, BN12 5EP

Chip swap

Graham Smith provides 'Eeprom Switching' in a DeltaDOS cartridge

THOSE of you with a DeltaDOS cartridge may have noticed that you have a spare socket sitting next to your ODS3 socket. You may know that Phoenix produced a couple of utility EEPROMs to fit in the memory area \$00000-8FFFF which is vacant above the ODS3 rom. The circuit layout is designed to enable one system socket when memory is accessed between \$C000 and \$DFFF, and the other system socket when memory is accessed between \$E000 to \$FFFF. This of course means that you can't reuse the ODS3 chip and the Phoenix chip socket because the data connection lines would have been located in the wrong memory area. The important pin is the OUTPUT ENABLE/BLANK (pin 20) on the 2764 EEPROM (in fact pin 20 is the ChipEnable/blank control socket pin 20 is strapped to pin 20).

Now, the point of this article is to explain how you can modify the circuitry so that the spare socket can be used to hold an alternative ODS3 (such as Deltadose/ODE4), which would normally be a direct replacement for the existing DeltaDOS3 socket and therefore expects to find location \$E0000 to \$DFFF. If you simply place it in the spare socket, it cannot function because it is the wrong memory area, however with an aid of a two-way switch, some wires and a couple of cuts in the printed circuit, you can switch the sockets over. The advantage of this is that you can have both systems permanently installed, eliminating the chances of damaging them when you need to change from one to the other. The disadvantage is the fact that you will lose the option to have the Phoenix or Delta chip fitted. You should also bear in mind that you should not attempt to switch with the power on.

If you are confident of your soldering technique and are determined to have a go, then read on. Remember to read the following instructions carefully as you will have to cut some tracks on the board and solder onto them accurately. If you get it wrong, it is over, problem. I do not guarantee anything here. The principle is very simple, all you are doing is to install a switch which will toggle the OUTPUT ENABLE/BLANK signal between the two options. You will need a double pole change over switch (I used a small piloting switch from Maplin), and four short lengths of wire (about 10 inches each should be enough). I suggest you use four different colours so you can keep track.

Before you start, decide where you are going to mount the switch on the cartridge case and ensure that it will not foul any of the components and that you will be able to get the cartridge back together. Also make sure that you cannot insert the cartridge in the socket the wrong way and that you can still fit the ODS3 connecting socket in place. Make sure that the lengths of wire that you are going to use, will reach from where they are to be terminated, to the final location of the switch. These may seem obvious, but if you forget them, you will be sorry.

First, find chip IC1. There is a small indentation at one end to indicate the top. If you look at the chip so that the indentation is at the top, pin 1 is the top left, pin 7 is the bottom left, pin 11 is the top right, pin 14 is the top right. In other words, the pins number anti-clockwise around the chip. Count around carefully to pin 19, this should be the middle pin on the right hand side. You will see a printed circuit track leaving the base of this pin, (yes pin 19). Carefully break the very careful not too many of the other tracks near it. I made two cuts close together across the track and scraped the track from between them (less than a millimetre). (Remember the track is only on the surface of the board, you don't have to go deep).

Second, find these three nodes marked U20A, U20B and have the track leaving U20A. Follow the track and you will find that it eventually ends on U20A 'C'. Cut this track just outside the white box surrounding the U20 holes (note U20 holes).

Third, there may be a wire link between U20A 'B' and 'C'. If there is, remove it (solderless). Fit a wire link between U20A and 'B'.

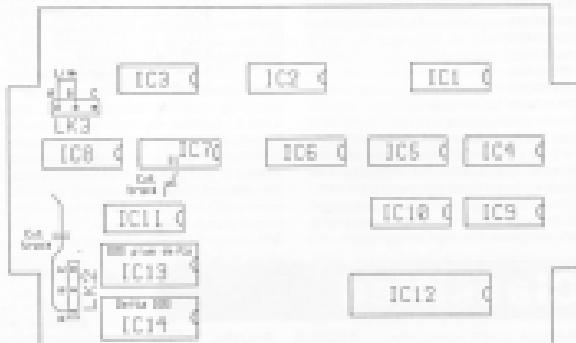
Fourth, let's define the contacts on your switch. It should have six terminals (legs), in two rows of three. Let's call one side 1, 2, 3 and the other side 4, 5, 6 counting anti-clockwise. You now have some wires to solder.

1. Connect switch leg 1 to switch leg 4
2. Connect switch leg 3 to switch leg 6
3. Connect switch leg 1 to U20A 'B'
4. Connect switch leg 3 to IC13 pin 20
5. Connect switch leg 2 to U20A 'C'
6. Connect switch leg 5 to IC2 pin 11

Now read through those steps again and see if you did it right.

Finally, insert your alternative ODS3 chip in the spare socket. Put the cartridge back together and connect up the drive lead. Insert the cartridge and power up. Depending on which way you left the switch, you will either get the DeltaDOS or your alternative ODS screen. Power off, slide the switch to the other position, power on and hopefully you should get the other ODS screen. The first time I tried this modification, nothing would work. The problem was simply the fact that the switch was faulty, and nothing I do with the modifications, but it did give me a very few moments. I had actually purchased three switches because they were cheap and having I found that only one was reliable. Obviously like most us, you get what you pay for.

If the idea of an alternative ODS for your Delta cartridge catches your imagination, I will add that Deltadose/ODE4 in memory alternative ODS I have heard of for Delta users. It is available from the an Orange Software or here <http://www.orientsoft.com>.



Delta DOS cartridge layout

